1. Term 1
    1. Political background
    2. Approach to development
    3. Approach to development in rhe RSA
    4. Technological development in environmental issues
    5. The green revolution
2. Term 2
    1. Agenda 21
    2. Environmental deficits in SA
    3. Production of waste materials
3. Term 3
    1. Social and environmental conflict in SA
    2. Social consequences of environmental needs
4. Term 4
    1. Photography
    2. Recognising topographic features
    3. Magnetic North map skills
    4. Calculating area oo a map

Political background

SOCIAL SCIENCES: Geography

Grade 9

DEVELOPMENT ISSUES

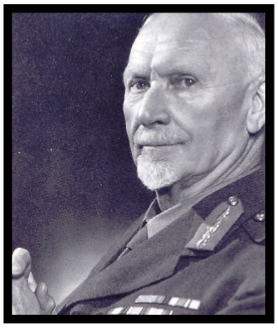
Module 1

POLITICAL BACKGROUND

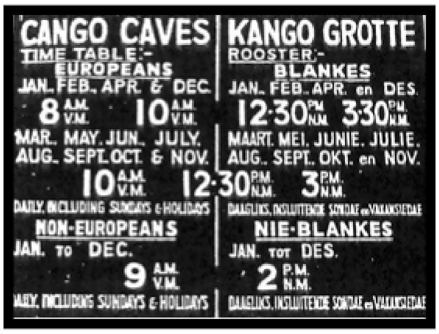
1. Political background

- The Second World War influenced political activities as well as development in South Africa. There was discord amongst the whites and the blacks were becoming impatient. The ANC and their Youth League became active and the Smuts government was in doubt about the road they should follow. The country was rapidly getting urbanised, which had certain implications for its development. The government of that time was of the opinion that segregation (separation and inequality amongst the different races) should be removed from the system. The pass laws became less stringent, blacks were recognised as men and women, and welfare programmes were launched to ensure the development of all the country's people. In the meantime, however, Afrikaner nationalism was growing. This was the beginning of important changes in the country. Eventually the National Party won die general elections in 1948. This made them the governing party and the system of Apartheid became official. Segregation or the separation of races became formal practice, and all groups and areas were not developed equally. Certain areas and population groups remained behind. This is why we still refer to "previously disadvantaged communities". The present government is trying to rectify the situation by offering everybody equal access to

> development and prosperity. This is one of the country’s biggest challenges in which all of us have to cooperate.



Genl. J.C. Smuts – leader in the United Party



CANGO CAVES

TIME TABLE:-

EUROPEANS

JAN., FEB., APR. & DEC.

8 A.M. V.M. 10 A.M. V.M.

MAR., MAY, JUN., JULY, AUG., SEPT. OCT. & NOV.

10 A.M. V.M. 12·30 P.M. N.M. 3 P.M. N.M.

DAILY, INCLUDING SUNDAYS & HOLIDAYS

NON-EUROPEANS

JAN. TO DEC.

9 A.M. V.M.

DAILY, INCLUDING SUNDAYS & HOLIDAYS

KANGO GROTTE

ROOSTER:-

BLANKES

JAN., FEB., APR. en DES.

12·30 P.M. N.M. 3·30 P.M. N.M.

MAART, MEI, JUNIE, JULIE, AUG., SEPT., OKT. en NOV.

DAAGLIKS, INSLUITENDE SONDAE en VAKANSIEDAE

NIE-BLANKES

JAN. TOT DES.

2 P.M. N.M.

DAAGLIKS, INSLUITENDE SONDAE en VAKANSIEDAE

A typical example of separate amenities

The first three prime ministers after the National Party came into power. From left to right:dr. D.F. Malan (1948 – 1954), mr. J.G. Strydom (1954 – 1958) and dr. H.F. Verwoerd (1958 – 1966)

Activity 1:

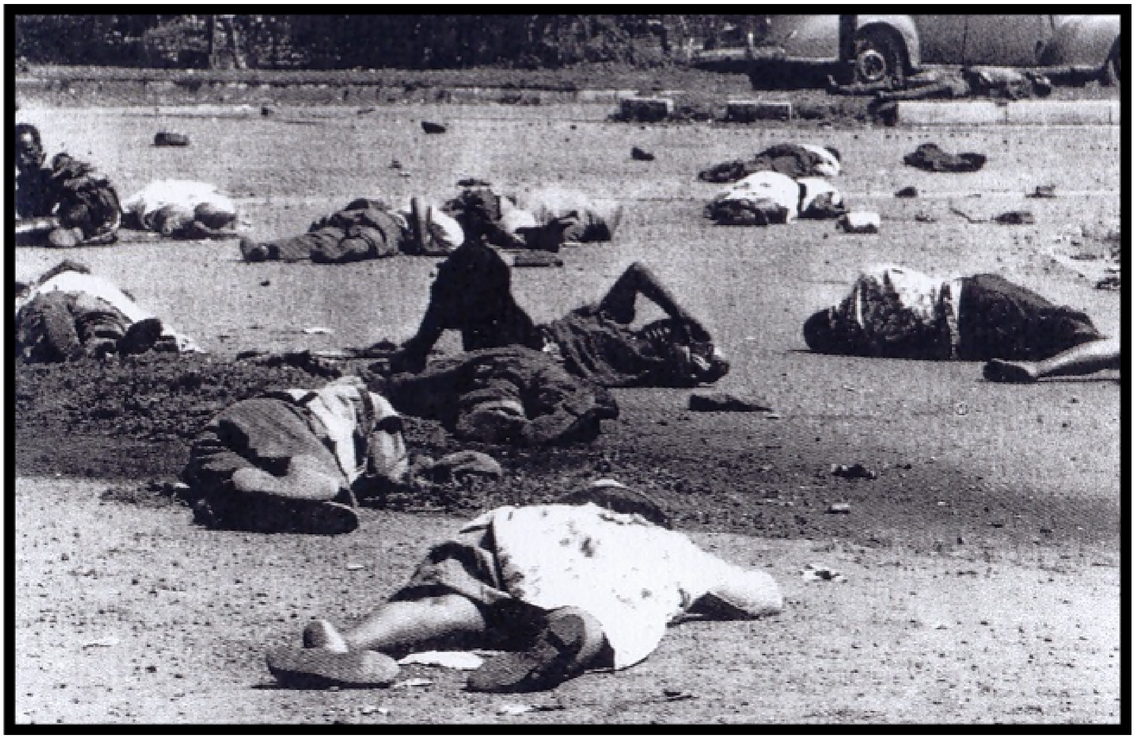
To write an essay on the changes that took place in South Africa after 1940

[LO 3.1, 3.2, 3.3, 3.4]

Study the following photos. Write an essay of one A4-page to describe the changes in more detail. Give examples of specific changes that had taken place. The History teacher and the learners' parents and other members of the family might be able to supply more information. Ask two or three learners to read their reports to the class, and encourage discussion.

District Six

Sharpeville



Selected sources to consult

1. Müller, C.F.J. e.a.: *500 Jaar Suid-Afrikaanse Geskiedenis,* Kaapstad. 1980

2. Ormer-Cooper, J.D.: *History of Southern Africa*, London, 1994

3. Welsh, F.: *A History of South Africa*, London, 2000

4. Giliomee, H.: *The Afrikaners*, Cape Town, 2004

Assessment

Learning outcomes(LO)
LO 3
EXPLORING THE ISSUES The learner can take informed decisions on social and environmental issues and problems
Assessment standards(AS)
This is clear when the learner:
1. identifies social and environmental conflicts in South Africa and compares it with other contexts [identifies the issue];

3.2 identifies factors that have an influence on selected social and environmental disputes, including those regarding rights; gender; social, economical and political claims within a specific context [factors affecting the issues];

1. analyses the reason for disputes or conflicts [makes choices];

3.4 takes informed decisions on various solutions to social and environmental conflicts [makes choices].

Approach to development

Social Sciences

GEOGRAPHY

DEVELOPMENT ISSUES

Grade 9

Module 2

APPROACH TO DEVELOPMENT

Approach to development

The level of development varies from country to country. According to these differences, countries can be divided into different categories or groups. Two terms which are often used, are **developing** and **developed countries.**

- **Developing countries** are still in the process of developing. The economic and social systems have not yet been developed sufficiently. The growth that does take place, is therefore not enough to supply in the needs of the country's inhabitants. One such example is Angola, where the development of basic services still lags behind that of other countries. Services such as health, housing, transport, education etc. still need to be expanded considerably before the total population will be properly cared for. Even in certain parts of South Africa some of the backlogs have not been met. Can you think of parts of our country where there is room for improvement? Are there similar needs to be found in your own area? What can the government and the inhabitants do about it?
- **Developed countries** have already attained a high level of economic and social development, like Germany, The Nederlands and most other

European countries. Large parts of the U.S.A., as well as certain areas in South Africa are well-developed. What are some of the typical features of developed countries?

Activity 1:

To become aware of different approaches to development in the RSA

[LO 2.1]

To talk about development, we need certain key concepts. The meanings of these words have to be fully understood to make sure we use them correctly.

Explain the following:

developed and *developing* countries (also give examples of countries or areas)

sustainable development: what does it mean?

Consult sources such as *Caring for the earth – South Africa: a strategy for sustainable living*, by John Yeld. This is a publication of the South African Nature Foundation (SANF) and the World Conservation Union (IUCN). ISBN 0-62017685-7

cornerstones of sustainability: measures to ensure sustainable development

urbanisation

Explain the concept, and name the implications. Also give your own opinion on the matter (What are your personal feelings, and what solutions do you suggest?)

depopulation of rural areas

Explain what the term means to you, and name the possible consequences. Also give your own opinion on this phenomenon (How do you feel about it, and why? What solutions can you suggest?)

First World (Give examples of “First World countries”, and give reasons why they are called as such.)

Third World (Give examples of Third World countries, with reasons why they are known as such.)

Activity 2:

To distinguish between developing and developedcountries

[LO 2.1]

Make a tick in the appropriate column opposite the name of each country to indicate if it is essentially a *developed or developing* country. What do you know about these countries to help you decide where to place your tick? It is necessary to gain factual knowledge about the different countries of the world. Chat to each other and to your families at home and find out what they know about each country. Learners who read the daily newspapers or watch news programmes on television, will find it easier to decide whether the following countries fall in the developed or developing category.

NAME OF COUNTRY:

- Zimbabwe
- USA
- France
- Congo

- Argentine
- Japan
- Russia

Activity 3:

To conduct a class discussion on the RSA as a developing country

[LO 2.1]

the RSA is a third world and developing country and should be managed accordingly

Discuss this statement. Give reasons why you agree or disagree with this statement, and explain how you reached your conclusion.

Assessment

Learning outcomes (LO)
LO 1
GEOGRAPHICAL RESEARCH The learner can apply research skills to study geographical and environmental concepts and processes.
Assessment standards(AS)

This is clear when the learner:
1.3 analyses and makes inferences from sources such as photo’s, maps, atlases, graphs and statistics [working with sources];
1.5 recognises information in the field and records it [working with sources];
1.7 reports and formulates knowledge obtained during the research by means of an argument and interpretation based on sources of information; uses maps, diagrams and graphics; uses, where necessary, computers in the presentation [communicating the answer].
LO 2
GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING The learner can demonstrate geographical and environmental knowledge and understanding.
This is clear when the learner:
2.1 gives a well-argued explanation of some approaches to development [people and places];
2.2 identifies ways in which Science and Technology have a positive and a negative influence on development [people and resources];
2.3 explains how sustainable [people and environment development can have a positive influence on people, places and environments].

LO 3

EXPLORING THE ISSUES The learner can take informed decisions on social and environmental issues and problems

This is clear when the learner:

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1. analyses the reason for disputes or conflicts [makes choices];

3.4 takes informed decisions on various solutions to social and environmental conflicts [makes choices].

Memorandum

ACTIVITY 1:

Developed: Countries who have achieved a high level of economic and social development.

Characteristics: First World, industrialised, high income, north of the equator, high level of human development, economically developed, owners and wealthy

Examples: Most European countries, USA, Switzerland, Japan, etc.

Developing: Countries who are still in the process of developing economically and socially. Some parts of the country may have developed fully, while other parts are still totally underdeveloped.

Characteristics: Third World, non-industrialised, low income, south of the equator, limited human development, less economically developed countries, non-owners and poor.

Examples: South Africa, certain South American countries and countries in Asia, African countries such as Ethiopia, Zimbabwe, DRC, etc.

Sustainable development:

It entails the discerning utilisation of natural resources. Development must attend to the

present need for prosperity and at the same time pay attention to conservation with a view to

the future. Must not be detrimental to the environment and must protect the interests of future

generations.

Building stones for sustainability:

Take the following factors into consideration: people, earth and prosperity. Three important building stones: economic growth, social responsibility and maintaining an ecological balance. The success or lack of it, when implementing a sustainable development strategy, depends largely on the extent to which a government succeeds in alleviating poverty.

Urbanisation:

Definition: The process when an increasing number of people leave the rural areas to settle in the cities.

Opinion: Consider the following:

Causes problems for the rural areas

Social and economic problems

Also urban problems such as over-population, unemployment, squatting, various shortages, crime, etc.

Solution: Decentralising industries, job creation, resettlement of people in rural areas, housing projects, implementing minimum wages, RDP projects, etc.

Depopulation of rural areas:

Definition: Process when people leave rural areas. Growing process, especially in developing and developed countries.

Results: Deterioration of towns, buildings and services. Schools, business enterprises, etc. close down, Economic and cultural deterioration and decay.

Solution: Create job opportunities, tourism, decentralisation, resettlement initiatives, etc.

First World:

Examples: Mainly countries north of the Sahara

Europe (North and Central), USA, China, Japan, etc.

Norway. Sweden, Australia, Canada, Netherlands, England, Germany, etc.

Reasons: Fully developed economically, politically and socially .Growth rate low, mortality rate low, life expectancy of people high, per capita income of people high, etc.

Third World:

Examples: Mainly Sub-Sahara

Most countries in Africa, South American countries, parts of Asia, etc.

Sierra Leone, Niger, Mali, Mozambique, Ethiopia, DRC, etc.

Reasons: Not yet fully developed, or must still develop. Refer to previous answer: opposite.

ACTIVITY 2:

Developed: USA

France

Japan

Characteristics:

Zimbabwe

Congo

Russia

Mozambique

Namibia

Argentine

ACTIVITY 3:

Consider the following:

Agree!

Contains elements of both.

Economically well developed.

Consider mining. Of seven of the ten most important minerals in the world South Africa is the top producer.

Secondary activities contribute extensively to the GNP.

Apartheid has left scars.

Large backlogs amongst the largest part of the population. Expand on this.

Approach to development in rhe RSA

Social Sciences

GEOGRAPHY

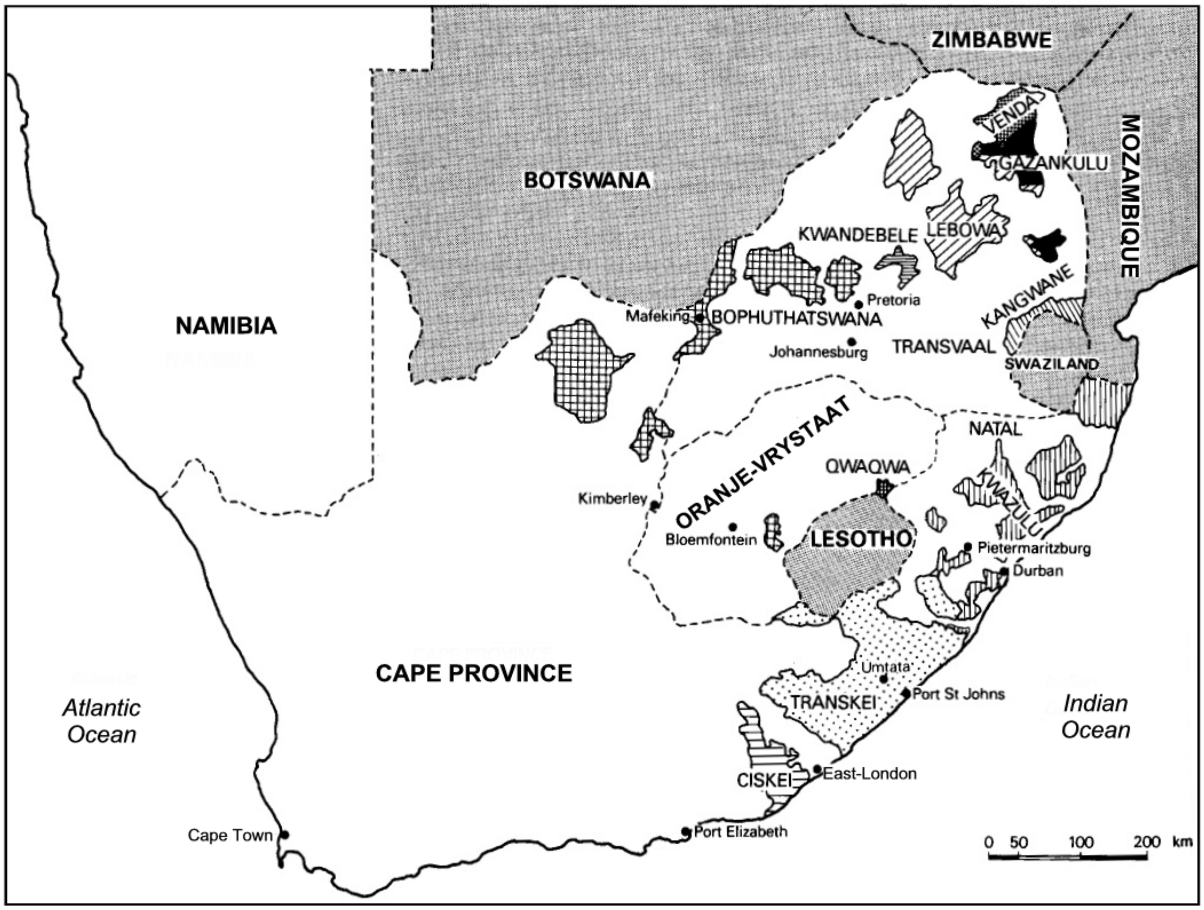
Grade 9

DEVELOPMENT ISSUES

Module 3

POLITICAL BACKGROUND

Approach to development in the RSA



Map of the RSA with former tbvc countries

First step: Development areas

Before we start discussing the issue of development, it is best to get a total picture by looking at the map. Where would you expect to find the most and the least development, and why? Have you ever visited any highly developed as well as totally undeveloped areas? Tell the other learners about it, or write it down, and compare notes.

Now we can broadly divide the country into DEVELOPMENT AREAS or areas where a lot of development has already taken place. By including the former TBVC countries (find out what the latter means), the areas will to a large extent agree with the present nine provinces, i.e.

1. Western Cape (the present Western Cape and parts of the

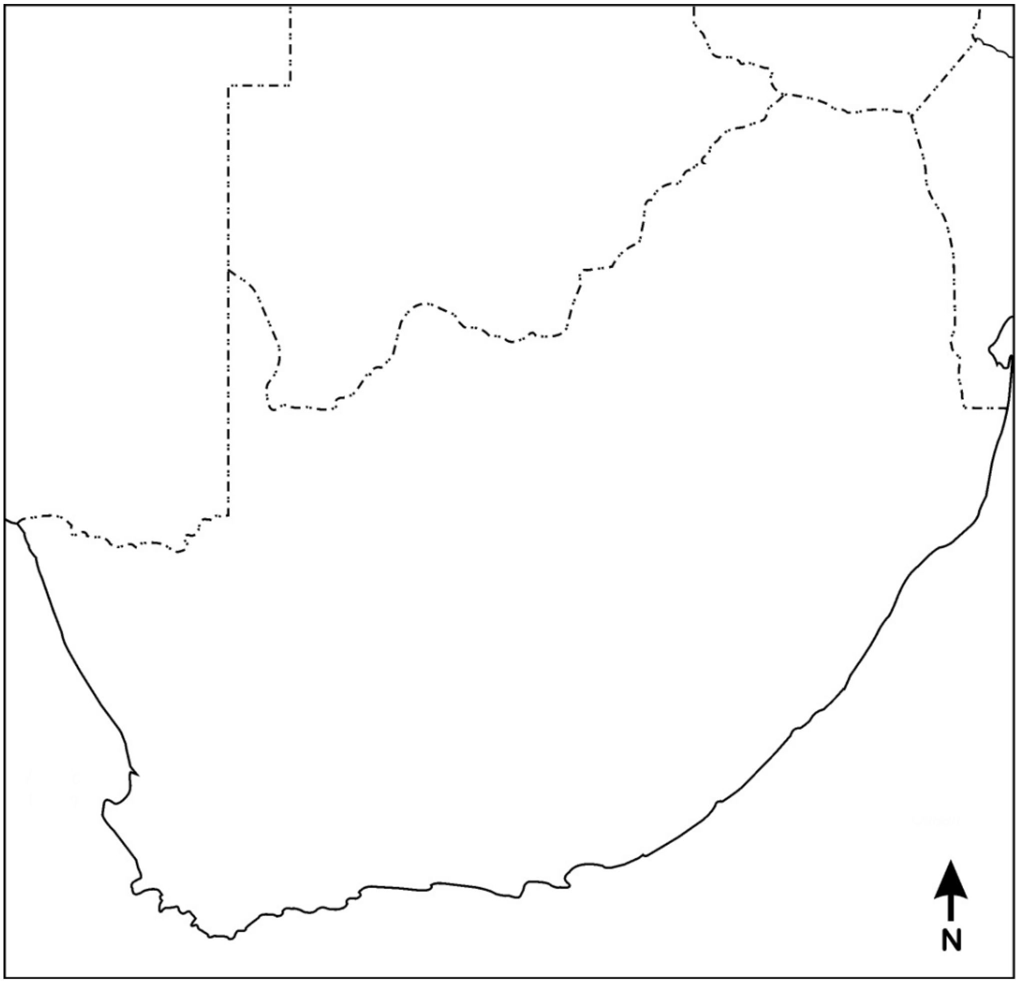
Northern Cape) [Western Cape]

1. Northern Cape (parts of the Western Transvaal and

Bophuthatswana) [Northern Cape]

1. Orange Free State (Qwaqwa and Bophuthatswana) [Free State]
2. Eastern Cape (Ciskei/Transkei) [Eastern Cape]
3. Natal/Kwazulu/Transkei [Kwazulu-Natal]
4. Mpumalanga (KaNgwane/Lebowa/Gazankulu) [Mpumalanga]
5. Limpopo (Venda/Lebowa) [Northern Province]
6. PWV (Bophuthatswana/KwaNdebele) [Gauteng]

Development in Regions 4, 5 and 7 was important, as UNEMPLOYMENT figures were very high. To ensure development, job opportunities were needed and workers needed to be employed to improve their quality of life and earn money to buy the most basic provisions. (What do you regard as vital steps in creating new job opportunities? Why does the government not simply hand out money to the poor? A sensible answer is needed if you intend to take part in planning the future).



Map of the RSA with development centres

Second step: Development of regions/towns

Specific centres of development already exist.

It is important to know where these regions are and to realise that development contributes to the lifestyle and quality of life of the inhabitants of those particular regions. (Give examples.)

Now start your research on the development and activities in regions/towns that are regarded as centres of a specific area. Include the following:

1. Large urban areas, e.g. four main industrial areas. First decide which areas you would like to study, and why. Then collect information on

the locality, history, climate, natural resources, industries, farming, business enterprises, tourism and social development or services (educational institutions, hospitals, organisations, sporting and other activities) in these particular areas. How would you recognise a typical developed landscape? What type of lifestyle do the inhabitants enjoy, and what would they not be familiar with at all? Why? Would you prefer to live in an urban and developed area yourself? Why?

2. Deconcentration points, e.g. Atlantis (Cape Town); Imbali (Durban); Babelegi (North of Pretoria). “Deconcentration” means that the centres of activity are moving outwards, so that centres of development are no longer concentrated in the urban areas only. “Concentration” happens when everything evolves around a single point, while “deconcentration” means spreading out from one point. In language studies we would call them “opposites”. You should be able to apply this grammatical term to Geography. (Think about other forms of “opposites” or “contrasts” occurring in other countries or regions. You could even try to write a poem on geographical contrasts, or illustrate it in a work of art. It could also serve as a topic for an oral discussion or essay in any of the official languages.)
3. Discuss the large centralised industrial development areas, e.g. George; Vredenburg-Saldanha; Mafikeng; Queenstown; Richards Bay; etc.
4. Find out which other industrial centres have potential, but have not yet been fully developed. What do you regard as the possibilities or potential of these particular areas? What type of initiatives would serve to speed up development in such areas? Think of cheaper railway transport, lower electricity tariffs, housing, financial aid, private initiatives by entrepreneurs, etc.

Third step: Development programmes

Make a study of RIDP – the Regional Industrial Development Programme of 1991.

Objectives of RIDP:

- Increased and wider regional development is envisaged to the advantage of larger regions as well as a larger section of the population.

- Move even further away from decentralisation points – develop the entire region so that everybody is involved, allowing all to profit from the development.
- Provide the various kinds of support needed for development as mentioned in Step 2.
- Launch programmes such as the RDP to address work opportunities, employment, and the issues of poverty. (What is the RDP program? Do you know of any such initiatives where you live? Information should be obtainable from the city council, or they will refer you to people who are knowledgeable on this issue.) What is your opinion on such a program? Could you suggest similar plans for development? What do you regard as priorities in your own region?

Activity:

To present information on a map and make conclusions

[LO 1.3]

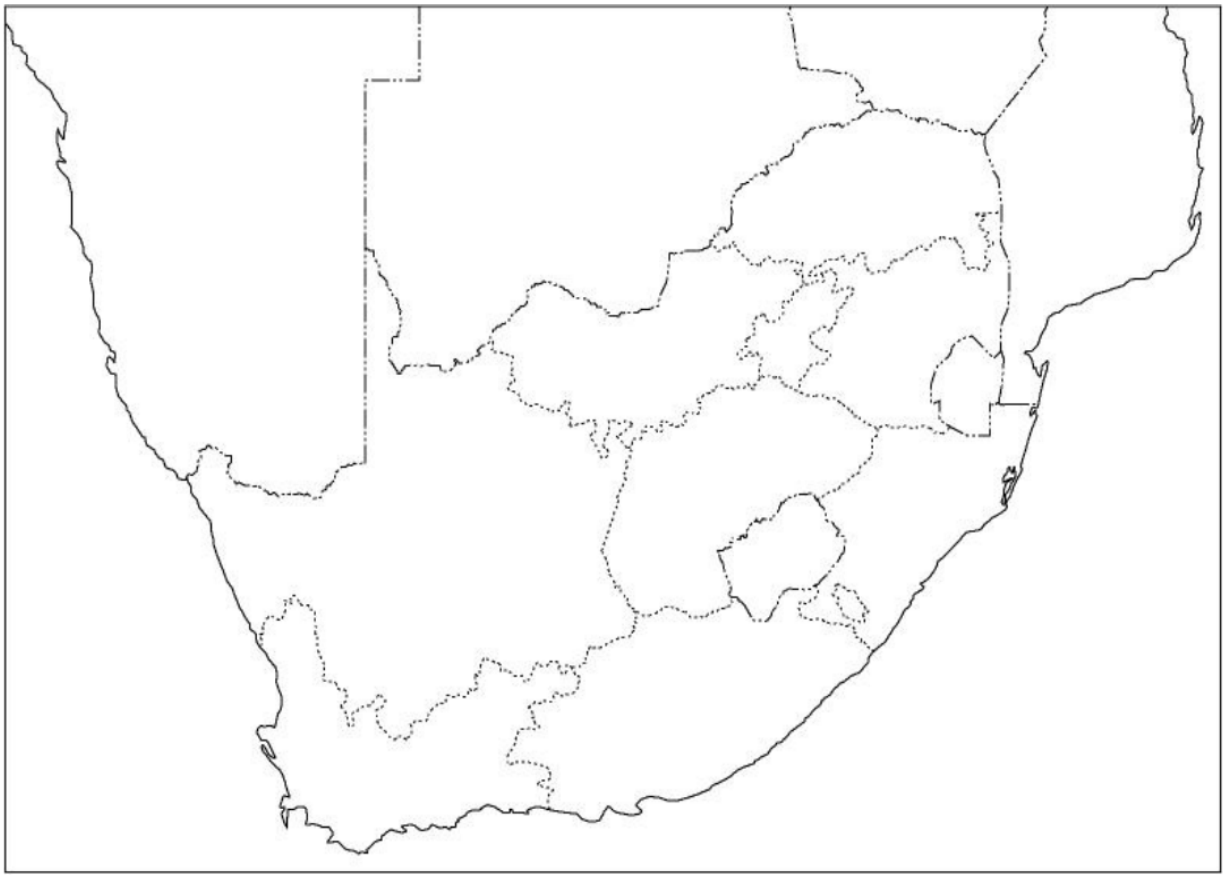
a) Draw the revised map of South Africa with its new provinces on tracing-paper and lay it over the map on p. 8. (The outline of each map should be of exactly the same size.)

b) Now compare the two in respect of:

the size of the areas of land;

distance from the large urban areas;

c) Make your own conclusions about the success/failure of the models.



Assessment

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LO 3

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Technological development in environmental issues

Social Sciences

GEOGRAPHY

DEVELOPMENT ISSUES

Grade 9

Module 4

POLITICAL BACKGROUND

The role of technological development in solving environmental issues

Technology and the growing need for food

As the world population grows, natural resources become more strained. This means that the soil must produce even more crops to feed the population. Traditional methods of cultivating crops are no longer efficient to produce food for the entire world population. In some countries, however a surplus or overproduction of agricultural crops is presently produced (e.g. in the USA), while other countries still have a problem in respect of meeting the nutritional needs of the population (e.g. in Ethiopia, where a famine rages).

In an effort to rectify the situation, scientific methods are applied to increase the production of agricultural crops. For this, however, money, manpower, technology and research are needed. If it is successful, new cultivars may be developed, yielding higher crops than traditional crops. Certain cultivars of maize yield more heads than in the past. This in turn leads to a higher agricultural production, which means that more people can be fed. People suffering from malnutrition cannot remain healthy, continue working, and care for their families. Where people do not earn money to meet their basic needs, they cannot develop, and nor can their children. Neither can they contribute to the development their country.

Biotechnology

Biotechnology refers to scientific techniques based on a knowledge of biology. Biology studies life processes, for instance in plants. This knowledge plays an important role in the development of new crops. It may help to reduce the time and costs attached to the process of development. Other methods include the use of genes to combat soil toxicity, making plants insect-resistant, as well as increasing the nutritional value of plants.

In developing countries farmers can profit from methods such as adding a certain gene to the canola plant that produces betacarotene. This helps to replenish Vitamin A-deficiencies and thereby prevent damage to the eyes. Certain aspects related to safety and the ethics of genetic manipulation, however, still need to be clarified. Ethics deals with the moral principles of what is “right and wrong”.

The sciences also contribute to the improved management of our natural resources. In this way problems such as water shortages, the loss of fertile soil, the loss of natural trees and forests, an impairment of biodiversity, as well as the exhaustion of our fishing resources can be avoided.

Activity 1:

To find information on biotechnology and the application of scientific techniques

[[LO 2.3]

a. Although these processes are highly scientific, it might be a good idea to ask a person specialising in this field to speak to you in clear, everyday language. Most farmers and agricultural officers are particularly good at this, while someone from a local cooperative, laboratory or agricultural school could also make a contribution.
b. You could form small groups to conduct interviews with a number of these individuals.
c. Posters on your findings can make an interesting exhibition for all the learners of your school, and even for neighbouring schools and members of the public.
d. Why is biodiversity (maintaining different forms of life) so important?

Genetics

Our knowledge of cells, how they react and how they can be manipulated, is advancing rapidly. Words such as cloning, genetic manipulation, GMO's and gene therapy are becoming part of the everyday vocabulary in the media. Cell-biology, genetics and related fields are becoming even more important study disciplines.

Core information is passed on during the process of fertilisation. This information can be described as the plan according to which the new organism is to develop. The plan is inscribed in a special molecule, known as DNA. DNA consists of codes. These codes determine all the features of the new organism.

These codes are found in short units called genes. The study of this molecule and structures such as genes, and the way in which it is passed on from one generation to the next, is called genetics.

Activity 2:

To find information on genetic manipulation

[LO 1.7, 2.2]

Do the following on your own:

a) Go to the library and find information on different types of plants that have been genetically manipulated to ensure a higher production of crops. This is an example of how technology is used for development. Write down in your own words what you understand under genetic manipulation, and what is meant by technology. Find out what happens in laboratories, and how scientists in different fields contribute to the development of a country.

b) Visit the following website on the internet (you will be able to find many others):

Google.com:

Saby Ganguly: *From Bengal Famine to the GreenRevolution* (Use the title or key words in the title to execute a search).

Peter Rosset, Joseph Collins, Francis Moore Lappé: *Lessons fromthe Green Revolution*, Tikkun Magazine, March/April 2000

DIscuss the following statements in groups of two:

Activity 3:

To determine the effects of the use of toxic substances on human beings and the environment

[LO 2.1]

Pesticides can be applied to protect crops against damage from insects. It may, however, also have a negative influence on the eco-system.

a. Get absolute clarity on the meaning of the above statement.
b. Find out what detrimental effects the use of pesticides may have on human beings and the environment.

Activity 4:

To establish if food production in the RSA is sufficient to meet the needs of the people

[LO 2.3]

The big challenge facing the agricultural sector, is to produce enough food to provide for the world's fast growing population. In certain parts of the world, however, there are already people who cannot be fed sufficiently, and even die of hunger. According to the figures of the World Bank, over 840 million people in the world did not have enough to eat in the year 2000. In developing countries about 30 people per minute die of a food shortage. The production of food will have to increase by 50% to feed the additional two billion of people towards the year 2025. This makes the present situation much more complex than before the beginning of the Green Revolution in the 1970's.

a. Is this also happening in our country?
b. Are there also people who eat too much?

Activity 5:

To use communication networks for global research

[LO 2.2]

The enormous expansion of communication networks over the past few years can be applied for further global research on the agricultural sector. Fortunately information on the cultivation of a specific plant can be shared worldwide with other farmers who wish to plant similar crops, or who experience similar problems.

a. Write a science fiction story or drama about what would happen if agriculture were to disappear, and land is used only for industrial purposes or housing.
b. Have you noticed if the agricultural sector in your area is endangered in any way?
c. Why do people sometimes sell their valuable agricultural land?

Activity 6:

To establish if people are aware of aspects that impact negatively on the environment

[LO 2.2]

Environmental aspects that urgently need to be addressed, include poverty, deterioration of the environment, the erosion of genetic resources, as well as uncertainty around the availability of food. These factors influence a country’s development negatively and they are a disadvantage to the inhabitants. These factors do not change of their own accord. The inhabitants of each country must be made aware of these issues and they must have a desire to do something about it. Every person should develop a “green conscience”.

a. How do you understand the expression “green conscience”?
b. How can you contribute towards combatting these aspects that have such a negative impact on the environment?

Activity 7:

To discuss scientific development which ensures that food production remains in line with the population growth

[LO 2.3]

Science is regarded as an important factor in solving the problems already mentioned. Recently there were three important scientific developments that may help to ensure that food production remains in line with the population growth:

- The responsible use of bio-technology (no excessive or harmful use of fertilizers, toxic substances, genetic manipulation, etc).

- Better management and control of the natural resources (protection, conservation and development of water, land, trees, plants and crops).

- Application of the information revolution (the application of new information and findings that become available).

Give examples of the above to show that this knowledge can be applied in practice in order to make a difference.

Assessment

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L O 3

EXPLORING THE ISSUES The learner can take informed decisions on social and environmental issues and problems

This is clear when the learner:

1.
2. identifies social and environmental conflicts in South Africa and compares it with other contexts [identifies the issue];

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1. analyses the reason for disputes or conflicts [makes choices];

3.4 takes informed decisions on various solutions to social and environmental conflicts [makes choices].

Memorandum

ACTIVITY 1:

d) - Research purposes

- Preservation of the different species

- Conservation for posterity

- Ethic as well as aesthetic reasons

ACTIVITY 3:

It means that the discerning use of pesticides contains major advantages for the agricultural sector, but the indiscriminate use unfortunately can cause great damage to ecosystems.

How does it work? Ecosystems consist of different food chains and food webs. Your teacher will explain it to you.

These food chains consist of different trophic levels.

EXAMPLE: grass - sheep - man

or

grass - locust – frog - snake - vulture

The pesticides are applied to the plants to exterminate the locust plague. Frogs then eat the poisoned locusts and in turn they are poisoned, etc. In this way the poison spreads through the

trophic levels until the birds of prey are exterminated. It is a known fact that pesticides are becoming more concentrated as they move upwards through the trophic levels.

- In this manner a whole ecosystem can be destroyed.
- Soil can be contaminated by the rotting carcases.
- Water sources can become polluted.
- Other creatures can now pester farmers because the birds of prey have been exterminated.

ACTIVITY 4:

a. Yes
b. Yes

ACTIVITY 5:

c) - Negative factors such as farm murders, high input costs of farming, over- production, low value of the rand, low prices of agricultural produce, lack of services, etc.

- Make a profit

- Urbanisation

ACTIVITY 7:

a. Must be aware of the importance of the preservation of vegetation, animal life, ecosystems, etc. Be aware of conservation.
b.

- Do not pollute
- Do not waste
- Recycling
- Saving
- Educational programmes

The green revolution

Social Sciences

GEOGRAPHY

DEVELOPMENT ISSUES

Grade 9

Module 5

THE GREEN REVOLUTION

The Green Revolution

The Green Revolution refers to a campaign that was launched over thirty years ago to dramatically increase food production. The term was created by the Agency for International Development in the USA in 1968. The term refers to the period from 1967 to 1978. Initially the focus fell on the expansion of land used for the cultivation of crops. During this time the production of crops such as rice and wheat was doubled. These products are known as staple foods – find out what this means and in which countries rice or wheat is used as staple foods. Eventually other methods and techniques were used to improve the production of crops. The next five points are important:

- New crop cultivars
- Irrigation
- Fertilisers
- Pesticides
- Mechanisation

Activity 1:

To make a study of techniques used for increased agricultural production

[LO 2.1]

a) Write short notes on each technique, mentioning where it is applied – worldwide, as well as in your environment. Also briefly state its contribution to development. Try to bring along any visual material.

b) Write an essay or have a class discussion on what would happen if there is no more food left in the world or in our country.

c) What field of study would you follow if you want to make a contribution to solve these problems?

d) What career opportunities exist in this field?

e) Where is training in this field offered in our own country?

f) What is the role of farmers and farm workers regarding these issues, and what problems do they have to contend with?

a.
b. Ask somebody who lives on a farm to tell you more about it, or plan a trip to a farm or agricultural-technical institution where farmers or officials can offer more information.
c. Would you consider becoming a farmer, farm manager, farm worker or agriculturalist?
d. What are the challenges, advantages and disadvantages of the above?

The Green Revolution in India

The Green Revolution in India comprised three elements:

The continual expansion of farming areas

Doubling the output of crops on existing farmland

Making use of genetically improved seed

The Green Revolution led to a record wheat harvest in 1978 – 79, making India one of the largest agricultural producers.

The production of crops per agricultural land unit has increased by over 30% since the country became independent in 1947.

Genetically improved seed yielded very good results. Over 70% of the wheat crop, 35% of the rice crop and 20% of the manna- en grain crop came from genetically advanced seed.

The Green Revolution has led to the creation of job opportunities as the need for fertilisers and chemical substances increased, and more dams were built.

The Green Revolution transformed India from a famished nation into an exporter of food. What advantages did it hold for the country?

Lessons from the Green Revolution

Thee Green Revolution had its advantages, but certain lessons were also to be learned.

Activity 2:

To identify the most important lessons that the Green Revolution in India had taught us

[LO 1.5]

Read the text below and write a short paragraph on each of the lessons that had been learned.

Agriculture and the problem of overpopulation in India

The Green Revolution

When the population of a country grows so fast that it cannot produce sufficient food in the long run, it eventually leads to famine. India is such a country that could not succeed in feeding its entire population, for it is overpopulated to the worst degree, while primitive farming methods have caused the country’s crops to be of the lowest in the world. In an effort to align the production of food with the growing population, they have over the past thirty years tried to apply the so-called Green Revolution in India. The Green Revolution is based on the increased productivity of already cultivated land. This is achieved by the application of bigger amount of fertiliser and the cultivation of new crops. Training programmes have been developed to introduce inhabitants in rural areas to new ideas, farming methods and techniques. New wheat, rice and maize varieties were also developed which produced more seed, yielded higher crops, reacted better to the application of fertilisers, and contained more proteïn.

The effective use of fertilisers did not increase only the agricultural production, but also the water capacity of the soil.

Chemical as well as organic fertilisers were applied.

Consequently there was a total increase in the production that was slightly higher than the annual population growth. Several record grain crops were yielded from time to time.

Although the objectives of the Green Revolution were realistic and attainable, several problems regarding their application are still being encountered thirty years later.

The extremely conservative peasant farmers are very traditional in their ways, so that and renewal and change are met with scepticism and bias.

Most peasant farmers are still illiterate.

The peasant farmers are poor and cannot afford farming implements, insecticides, pesticides and fertiliser.

The Green Revolution is an expensive programme and there is a lack of capital for meeting the costs. The country increasingly relies on loans from abroad to pay for their programmes.

The only way to make the Green Revolution succeed, is to ensure that a balance is maintained between the growing population and the production of food. The population growth needs to be carefully controlled and planned.

Sources

Swanevelder, C.J. e.a. *Senior Geography Grade 8*, Cape Town, 1996

Ganguly, S. *From the Bengal Famine to the Green Revolution*, Internet (Google.com)

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Activity 3:

To establish if famine can be avoided by applying technological development

[LO 2.2]

Do we need technology to beat famine?

Study the following notes and use them as a basis to answer the above question in your own words.

yes:

There is no doubt that genetically manipulated seed yields higher crops. The Green Revolution has made a difference – experience and statistics have proved this.

It is therefore a tried and tested way to produce larger amounts of food over a short period.

But:

It seemed that the Green Revolution was not an ideal strategy to end the shortage of food.

More food for those who do not have enough, is not a solution. Those who go hungry must be empowered to have access to food on a regular basis. The concentrated distribution of economic power (favouring only a certain part of the population), and especially the limited access to land and spending power, must change.

The Green Revolution (including technology as such) did not solve the problem of the high birth-rate.

It is in Asia (including India) where new seed varieties contributed to the biggest production successes, that two-thirds of the world’s underfed population live (more than in Africa where the problem used to be the biggest). In India 5 000 children die of malnutrition every day. A third of India’s 900 million inhabitants are poor. There is an urgent need for development on different levels. Is this also the case in our country? Where?

Statistics show that the amount of food available to each person the world over, has risen by 11% from 1970 to 1990 (the GR period), while the number of hungry people has decreased from 972 million to 786 million. But if China’s statistics are not taken into consideration, it seems that the number of those who go hungry has risen from 536 million to 597 million. The improvement in China which distorts the world-wide figures, must rather be ascribed to the changes that have been introduced to give more people access to land.

Do we need technology to combat famine?

Technology-based farming is more expensive, which means that the profit margins become smaller, making a bigger turnover essential. The peasant farmer cannot afford the initial costs, and he does not generate the necessary turnover. Hence a vicious circle is established. The peasant farmer is forced out of the system, while agriculture is taken over by “super farms”. This aggravates the lot of the poor as they have no land to farm on, they cannot supply their own foodstuffs, even on a small scale.

Technology-based farming is not ecologically sustainable. The land is impoverished, asking for more and more additives.

Technology-based farming makes a country dependent on the import of raw materials (fertiliser, poisonous substances, etc.). As the country can no longer afford it, or it becomes isolated due to trade sanctions, the situation may become disastrous, as has happened in Cuba. Cuba was a model of technology-based farming until sanctions prevented them from obtaining the necessary raw materials. This caused the country’s biggest food crisis in history. Cuba then reverted back to a more self-reliant farming system and traditional farming methods, which led to an admirable recovery.

Summary

Under what conditions are bigger crops not the answer, and hunger not prevented?

a. When farmland, like any other commodity, is bought and sold, and society allows super farms to swallow all the remaining agricultural land, the old family estates disappear.

b. When the main producers of food (smaller farmers and farm workers) do not have the power to negotiate with suppliers of farm implements and product dealers, they do not get a fair share from their farming output. Can you name a few practical examples?
c.
d. When too much technology destroys the future food production by impoverishing the soil, or when there are problems with pests and weeds, it gets more difficult to maintain good crop yields. This means that the farmer has to invest more than he eventually earns from his crop. In the long run he gets poorer and poorer, until he may even lose his land and possessions. In this case we get deterioration

Assessment

Learning outcomes (LO)
LO 1
GEOGRAPHICAL RESEARCH The learner can apply research skills to study geographical and environmental concepts and processes.
Assessment standards(AS)
This is clear when the learner:
1.3 analyses and makes inferences from sources such as photo’s, maps, atlases, graphs and statistics [working with sources];
1.5 recognises information in the field and records it [working with sources];

1.7 reports and formulates knowledge obtained during the research by means of an argument and interpretation based on sources of information; uses maps, diagrams and graphics; uses, where necessary, computers in the presentation [communicating the answer].
LO 2
GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING The learner can demonstrate geographical and environmental knowledge and understanding.
This is clear when the learner:
2.1 gives a well-argued explanation of some approaches to development [people and places];
2.2 identifies ways in which Science and Technology have a positive and a negative influence on development [people and resources];
2.3 explains how sustainable [people and environment development can have a positive influence on people, places and environments].

L O 3

EXPLORING THE ISSUES The learner can take informed decisions on social and environmental issues and problems

This is clear when the learner:

1. identifies social and environmental conflicts in South Africa and compares it with other
2. contexts [identifies the issue];

Memorandum

ACTIVITY 1:

- All these techniques are applied in the wheat districts of the SWARTLAND (Malmesbury,

Moorreesburg and Piketberg).

- Own initiative

Agriculture and Agricultural Science

- Farmer, farm manager, agricultural officer, agricultural research, fertiliser industry
- Universities and at one of the 12 agricultural colleges such as Elsenburg near Stellenbosch
- Farmers: must farm economically to contribute to the economy

must create and maintain jobs for farm workers

Labourers: low wages, poor housing and other services, etc.

- Own initiative

Decide on your own

- Challenges: to farm successfully

to overcome negative factors

drought, floods, etc.

Advantages: own boss

could be financially very viable

Disadvantages: very lonely and isolated

could be dangerous

Agenda 21

Social Sciences

GEOGRAPHY

Grade 9

Sustainable utilisation of resources

Module 6

The principles of Agenda 21

Activity 1:

To investigate the importance of resources, their sustainable use and the responsibility that all of us have in this regard

[LO 1.3]

Read the following passages on *Agenda 21* and then answer the questions.

AGENDA 21 WORLD WIDE **AND THE** *LOCAL AGENDA 21*

Agenda 21 is a worldwide action plan for development that is socially, economically and environmentally sustainable. The term sustainable means that development can be sustained and continued, without exhausting the Earth’s natural resources. This plan was accepted at the United Nations conference on the Environment and Development that took place in Rio de Janeiro in 1992. Try to find this city on a world map and remember in which country and on which continent it is. The aim of *Agenda 21* is to develop principles and programmes for a better balance between *development* and the Earth’s *natural resources*. All development depends on this. The conference proposed that the principles of *Agenda 21* should be implemented throughout the world on the local level. This practical implementation programme is known as *Local Agenda 21*.

The *Local Agenda 21*- **Mandate**

By 1996, most local authorities in every country, should have completed a consultative process with their people, and should have reached consensus regarding the *Local Agenda 21*.

Local Agenda 21 **in South Africa**

First try to learn what we mean by the term ‘local’. As part of our own reconstruction and development programme, the three largest cities in South Africa (Johannesburg, Cape Town and Durban) began their own *Local Agenda 21* programme that was in agreement with the *Local Agenda 21* mandate in 1994/95. These early programmes started a series of activities throughout the country, so that cities such as Kimberley, Port Elizabeth, East London and Pietermaritzburg also started their own *Local Agenda 21* programmes. At provincial level, provinces such as KwaZulu-Natal and Limpopo launched campaigns to ensure that local authorities became involved with *Local Agenda 21* plans on a large scale. In 1998 the Department of Environmental Affairs and Tourism launched a *National Local Agenda 21* to support, co-ordinate and link activities in an extensive network throughout the country.

Principles of *Local Agenda 21* **in South Africa**

People-centred development. (Focus on training and empowerment of people, such as ……..)

Provision of basic needs (provision of facilities and services most needed by people, such as ……….)

Integrated planning and development instead of a sector-based approach. (The whole area and its people are developed together, not just certain aspects, e.g. ……….)

Sustainable development. The environment and resources are not negatively affected by prolonged development.

Local Agenda 21 **in Durban**

Durban's *Local Agenda 21* (LA21) programme was launched with the appointment of the city's first Environmental Manager in 1994. In 1995 a special section was created for this purpose.

After extensive support was obtained from key interest groups – inclusive of the local authorities, the public sector and new development forums – the Durban Town Council of the time accepted the mandate for the implementation of the *Local Agenda 21* as their responsibility in August 1994. This decision was later ratified (in 1996) by the relevant councils newly-constituted Durban Metropolitan area.

The aim of Durban's *Local Agenda 21* is the development of a system of environmental management that will support this city in its development as a city, but would also be sustainable in terms of the environment. This requires that new policy (with adjustments of direction and new ideals), institutions (such as committees or divisions) and procedures (ways of working) are planned. It also

requires monitoring (i.e. supervision and testing), revision and improvement of performance so that the environment remains preserved as stipulated in the sustainable aims.

During the Earth deliberations that took place in June 1992 in Rio de Janeiro, a global plan of action for sustainable development was compiled. This plan of action is known as *Agenda 21*. The aim of *Agenda 21* is to create principles and programmes to bring about changes in the relationship between development and the impact of development on the Earth's natural resources. This means that plans are made to ensure that development is carefully controlled so that the earth, nature, the resources and the quality of people’s lives are not destroyed. Sustainable development therefore includes social, economic and environmental aspects. (Exchange ideas about the meaning of these terms and give examples. Find out how these ideas compare with your teacher’s explanation.)

The aim was to apply the action plan internationally at local government level. In 1994/95 - as part of the RDP in South Africa (do you recognise this abbreviation?), the three largest metropolitan (urban) areas (Johannesburg, Cape Town and Durban) applied this programme. The programme acted like a catalyst to set activities going right through the country. Cities and towns such as Kimberley, Port Elizabeth, Pietermaritzburg and East London later put into practice their own *Agenda 21* ideas. Provinces such as KwaZulu-Natal and Limpopo launched their own initiatives.

a) Write down a definition of *Agenda 21*. (Explain what it is how it came about and what its purpose is in your own words.)

Agenda 21 is __________

b) What is meant by *Local Agenda 21*? (Clue: words such as ‘own’ and ‘local’ may help.)

c) Write down the principles of *Local Agenda 21*.

d) Divide into four groups. Each group must concentrate on one of the principles.

In a short paragraph, write down what the principle that was allocated to your group means, e.g. what does ‘people-centred development’ mean? Give examples.

Place yourself in the position of a consultant to the town councils of Johannesburg, Cape Town or Kimberley. Develop ideas for the implementation or execution of your principle at local level. Write down your ideas and prepare a presentation that must be considered by the town council. Write a covering letter in which you indicate the central ideas of the presentation that is attached. Set out your ideas clearly and provide practical examples that may contain sketches and perhaps a map of the city.

(The RDP is part of this process. Try and obtain pamphlets from the town council that may be of help in your presentation. Ask people who live with you if they know what RDP stands for and find out what the equivalent in Afrikaans is – or in any other language.)

Assessment

Learning outcomes (LO)
LO 1
GEOGRAPHICAL RESEARCH The learner can apply research skills to study geographical and environmental concepts and processes.
Assessment standards(AS)
This is clear when the learner:
1.3 analyses and makes inferences from sources such as photo’s, maps, atlases, graphs and statistics [working with sources];
1.5 recognises information in the field and records it [working with sources].
LO 2
GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING The learner can demonstrate geographical and

environmental knowledge and understanding.
This is clear when the learner:
2.2 identifies ways in which Science and Technology have a positive and a negative influence on development [people and resources].

Memorandum

ACTIVITY 1:

a. It is a world wide plan of action to ensure sustainable development.

- It is a wide reaching plan of action that is applied
- on GLOBAL level
- NATIONAL level
- LOCAL level
- by organisations and governments
- who are in affiliation with the United Nations
- applied in all areas where human activities have an impact on the environment

It was launched in June 1992 during the Earth deliberations in Rio de Janeiro.

The purpose of *Agenda 21* was to create principles and programmes to establish

a better balance between development and the natural resources of the Earth.

These principles and programmes are implemented and applied internationally

and on local management level.

The purpose is to empower Local Government (Municipalities and Metropolitan Boards) to compile and manage their own *Agenda 21* program according to their own local requirements.

a. **People-centred development:**: It focuses on the training and empowerment of people.

Provide basic needs: The purpose is to supply basic facilities and services to all people.

Integrated planning and development: Instead of a sector-based approach it focuses on the development of the whole area and its people and not only on certain aspects or people.

Sustainable development: It focused on the conservation of the environment and its resources despite development.

Environmental deficits in SA

Social Sciences

GEOGRAPHY

Grade 9

Sustainable utilisation of resources

Module 7

ENVIRONMENTAL DEFICITS IN SOUTH AFRICA

1. Physical Geography

The South African ecosystem is characterised by low rainfall, water shortages and soil that is vulnerable to erosion. About 65% of the country has less than 500 mm of rain per year, the minimum required for rain-dependent crop-farming.

About 65% of the arable land in South Africa contains very little organic material (humus) and becomes impoverished quickly as a result of repeated usage.

The low rainfall and poor soil results in only 16% of the arable land being suitable for crop-farming. The rest of the land is used for grazing. Only about 16% of South Africa's arable soil was situated in the 'homelands' of the past. This imbalance, combined with the low rainfall, led to extensive environmental deficits in the 'homelands'.

2. Structural deficits during Apartheid

The apartheid system formalised the unequal social distribution of environmental resources in South Africa. It led to serious structural deficits within the black communities. They not only had inadequate access to land; their monthly income from farming did not make it possible for them to invest in their land. This shortage of land was made worse by the fact that the quality of the soil was poor and needed extensive cultivation.

Table 1: Comparison of population densities in rural South Africa, 1991

	Population density (Hectare/person)………………………………………………..		
	South Africa	**White areas**	**Former homelands**
Cultivated land and grazing	4,70	16,22	0,92
Cultivated land	0,75	2,54	0,16

Table 2: Comparison of yield in crop farming, Natal and Kwazulu – 1983-1984

Crops………………………………………………….. **Crops…………………………………………………..**		Yield (tonne/hectare)	
Natal	KwaZulu		
Maize		2,088	0,826
Dry beans		1,011	0,337
Potatoes		24,015	5,006
Sugar cane……………………………………………….		53,814	28,795

In the homelands the land was unequally divided and 20% of the farmers were in control of 80% of the production. Even in the Transkei (which is now a large proportion of the Eastern Cape Province) the shortage of land was a serious problem.

In urban areas, the black areas were situated in environments that were unusable for whites. They were overpopulated with too few houses and situated in areas downwind from industrial areas. The services and infrastructure were bad. The houses were built from waste material and were not proof against the elements especially water.

The structural deficit worsened the availability and the demand-driven deficits.

3. Demand-driven deficits

Of the estimated South African population of 42,6 million in 1995, 28 million lived in towns and cities while 15 million lived in urban areas. It was estimated that the black population of 32 million would have grown to 37 million and the white population would still be around 5 million by the year 2000.

This growth in the black population made the shortage of land even worse. During the apartheid era the population density in the homelands was 10 times higher than that in the white areas. The conditions in the homelands resulted from forced migration: it caused the population to grow from 4,5 million in 1960 to 11 million in 1980. The size of the homelands remained the same.

Besides the inward migration, the birth rate in the homelands was very high. It is ascribed by some to the defective educational system, health care, family planning and guaranteed sources of support. Gender discrimination also contributed to this situation. The birth rate from 1985 to 1990 was estimated as 5,12 per woman. Research has shown that women that were not employed and therefore did not earn a fixed salary had fewer decision-making rights in their families. This,

together with the value that children had as workers in regard to what had to be done in the homes – such as gatherers of firewood and taking care of animals – also led to a higher birth rate.

Table 3: Population profile, KWAZULU-NATAL, 1992		
……………………………………………………..	**Population…………….**	
	Thousands	**% of total**
Urban	2,290	24,7
Towns	350	3,8
Total urban settlement	2,640	28,5
Informal urban	1,550	16,7
Informal towns/villages	470	5,1
Transitionary (rural/urban)	400	4,3
Total urban informal	2,420	26,1
Total urban	5,060	54,6
Total rural	4,210	45,4
Grand total	9,270	100,0

4. Availability-driven deficits

The apartheid government placed the homelands in fragile environments with poor topsoil. This environment couldn't carry the agricultural production that was needed by the people. This resulted in serious soil erosion. The per capita food production fell drastically and food had to be imported without anything being exported. Research shows that the South African loss of topsoil was 20 times higher than the world average. Experts estimate that, since 1900, South Africa has lost 25% of its topsoil and that 55% of the country is threatened by the growth of desert areas. This has happened at a time when South Africa's need for food is a central concern and is expected to double by the year 2020.

Deforestation is an important type of availability-driven environmental deficit. The destabilisation of soil and changing local water cycles disrupt the ecological balance. Unfortunately for many black South Africans in rural areas firewood is the

most available and cheapest of all sources of energy. This leads to deforestation. In the past 50 years, 200 forests in KwaZulu have vanished.

Another problem is the shortage and degradation of water. South Africa is a country with serious water shortages: 12 to 16 million people haven't any access to water that is suitable for putting into a can. About 70% of Black people in urban areas have no access to running water and have to rely on polluted river systems for their daily needs. About 21 million people need adequate sanitation. Industrial pollution threatens the quality of river and underground water. Die health of the South African society generally is threatened.

Activity 1:

To identify the different environmental deficits in the RSA

[LO 1.5]

1. Physical Geography

The South African ecosystem is fragile and we all need to contribute to its maintenance. Give reasons for the fragility of the South African ecosystem. How would you define “fragile”? How would you be able to contribute to the sustainability of the ecosystem (so that it remains intact and is not negatively affected)? Do this in table form, as follows:

Reasons for the fragility of our ecosystem	**What you could do to make our ecosystem more sustainable**

2. Structural deficits

a) Give FIVE reasons why it was impossible for black people in the homelands to make a success of farming. (Remember that “structural deficits” are related to weak places in the system.)

3. Demand-driven deficits :

a) Explain in your own words what “demand-driven deficits” mean.

b) Draw two conclusions from each of Tables 4 and 5.

4. Availability-driven deficits:

a) Explain what “availability-driven deficits” signify.

b) How does deforestation contribute to availability-driven shortages?

5. Draw up a summary of the reasons why urbanisation took place so rapidly in recent times in South Africa.

Activity 2:

To answer questions about environmental pollution

[LO 2.2]

With a partner:

Study the following table and then answer the questions that follow:

Problem	**Impact**	**Area**
Soil compaction	2 million hectare	Highveld – maize
Salinisation	1,2 million hectare	Irrigated soil
Pollution	31 000 hectare	Industrial / Domestic

1. Which of the problems in the above table affect the largest area?

2. Where does the problem of salinisation occur most generally?

3. What are we able to do in our homes to minimise or prevent the effects of pollution on agricultural land?

Assessment

Learning outcomes(LO)

LO 1

GEOGRAPHICAL RESEARCH The learner can apply research skills to study geographical and environmental concepts and processes.

Assessment standards(AS)

This is clear when the learner:

1.3 analyses and makes inferences from sources such as photo's, maps, atlases, graphs and statistics [working with sources];

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LO 2

GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING The learner can demonstrate geographical and environmental knowledge and understanding.

This is clear when the learner:

2.2 identifies ways in which Science and Technology have a positive and a negative influence on development [people and resources].

Memorandum

ACTIVITY1:

a) Low rainfall: Plant crops that adapt to rainfall figures

- Water shortage: Build catchment dams and water restrictions
- High population growth: Education
- Deforestation as a result of

Development: Plant natural forests

- Subsistence farmers - causes

erosion: Scientific farming methods

2. a) - Not sufficient access to fertile soil

- Soil of inferior quality
- Not sufficient funds to purchase seed, implements and fertiliser
- Traditional farming
- No market for produce

3. a) Shortages that occur as a result of population growth. An expanding population demands more land, more food, etc. A larger demand for basic resources arises due to a growing population.

b) **TABLE 4:**

1) Urban areas grow more rapidly (3%) than rural areas in KwaZulu-Natal.

2) Informal settlements grow more rapidly (4%) than rural settlements in KwaZulu-Natal.

TABLE 5:

1) Approximately half of the urban dwellers in KwaZulu-Natal live in informal settlements.

Urban settlements accommodate most people (54,6%) in KwaZulu-Natal.

4. a) Shortages that arise as a result of the over-utilisation of particular resources precisely because these resources are available.

EXAMPLES: - Trees are felled for firewood.

- Useful water resources are over utilised.

b) It disrupts the ecological balance. It reduces the number of forests and as a result the number of trees. It contributes to the fact that the soil no longer is kept stable (compacted) by their root systems. The top soil therefore is very vulnerable, especially to water and wind erosion.

5. **CONSIDER THE FOLLOWING:**

Push factors: Poor and insufficient housing

Lack of basic services, such as: medical, educational services, etc. in rural areas

Few job opportunities

Physical problems such as: poor soil, low rainfall, consolidation of farms, farm murders, etc.

Poor wages

Uneconomical units

Pull factors: More and better housing

More job opportunities

Higher wages

Better and more basic services

Availability of high order services – supply examples

Means of communication, etc.

ACTIVITY1:

a) Low rainfall: Plant crops that adapt to rainfall figures

-
- Water shortage: Build catchment dams and water restrictions
- High population growth: Education
- Deforestation as a result of

Development: Plant natural forests

- Subsistence farmers - causes Scientific farming methods

Erosion:

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- Not sufficient funds to purchase seed, implements and fertiliser
- Traditional farming
- No market for produce

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Physical problems such as: poor soil, low rainfall, consolidation of farms, farm murders, etc.

Poor wages

Uneconomical units

Pull factors: More and better housing

More job opportunities

Higher wages

Better and more basic services

Availability of high order services – supply examples

Means of communication, etc.

ACTIVITY 2:

1. Land densification
2. In irrigation areas (soil-)
3. – Do not scatter garbage
4. – Do not dump household or other refuse in rivers or water resources

– Recycling refuse

ACTIVITY 3.1:

ALL: Special dumping site

ACTIVITY 2:

1. Land densification
2. In irrigation areas (soil-)
3. – Do not scatter garbage
4. – Do not dump household or other refuse in rivers or water resources

– Recycling refuse

Production of waste materials

Social Sciences

GEOGRAPHY

Grade 9

Sustainable utilisation of resources

Module 8

THE PRODUCTION OF WASTE MATERIALS

In South Africa, 42 million cubic metres of waste material is generated in a year. The largest portion of this material is produced in Gauteng. The average amount of waste material produced per person per day in South Africa is 0,7kg. The sector that contributes most to this stream of solid waste is the mining industry. They contribute 72,3% of the solid waste material. After this, fuel contributes 6,7% of the solid waste. Agricultural waste contributes 6,1%, while waste from urban areas amounts to 4,5% of the total. Sewerage amounts to 3,6% of the solid waste.

Such high levels of waste material and pollution are cause for concern. A large amount of the dangerous waste (such as chemical materials) are not treated or disposed of properly. Only 5% of the 5 million cubic metres of chemical waste that is produced eventually reaches the dangerous waste-disposal sites.

Activity:

To identify ways of disposing waste

[LO 2.2]

On your own:

Study the table below and identify the safest methods that can be utilised to dispose of waste materials. Just place mark the correct column with X to indicate your choice:

TYPE OF WASTE	REFUSE DUMP	REFUSE DUMP	SPECIAL FACILITY
Cans and vegetable skins			
Sewerage			
Industrial acids and poisons			
Old oils and lubricants			

Assessment

Learning outcomes(LO)

LO 1

GEOGRAPHICAL RESEARCH The learner can apply research skills to study geographical and environmental concepts and processes.

Assessment standards(AS)

This is clear when the learner:

1.3 analyses and makes inferences from sources such as photo’s, maps, atlases, graphs and statistics [working with sources];

1.5 recognises information in the field and records it [working with sources].

LO 2

GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING The learner can demonstrate geographical and environmental knowledge and understanding.

This is clear when the learner:

2.2 identifies ways in which Science and Technology have a positive and a negative influence on development [people and resources].

Memorandum

ACTIVITY:

ALL: Special dumping site

Social and environmental conflict in SA

Social Sciences

GEOGRAPHY

Grade 9

SOCIAL AND ENVIRONMENTAL CONFLICT IN SOUTH AFRICA

Module 9

SOCIAL AND ENVIRONMENTAL CONFLICT

1. Political background

After Nelson Mandela was released in 1990, conflict in South Africa escalated, while many people expected it to be the beginning of a more peaceful society.

This was the result of a combination of environmental needs and social unrest in South Africa over the past decades. South Africa faces serious environmental problems, but in recent times these were overshadowed by the negative social effects of apartheid, a resistance to minority government and the effort to establish a post-apartheid political dispensation. Despite the successful transition to a full democracy, the apartheid system was responsible for a problematic ecological legacy which will still be affecting the political, social and economic situation for many decades to come. The prospects for a prosperous, peaceful and democratic South Africa become even dimmer if we take into account that our environmental needs may influence our social stability.

Environmental needs, within the context of apartheid, have contributed to:

a decrease in agricultural productivity in the formal homelands;

migration to and inside urban areas; and

the deterioration of the local urban environment.

2. South Africa: after apartheid

The expropriation of land that once belonged to the original inhabitants of South Africa had already started with the British colonial rule, but racial segregation became entrenched with the victory of the National Party in 1948, and their subsequent enforcement of apartheid. Due to apartheid, 87% of the land fell into the hands of the whites, while the blacks, about 75% of the population, lived in homelands comprising about 13 % of the land.

The black population had to maintain themselves in these areas by means of agriculture, local service industries and migratory labour in mines and industries owned by whites.

From 1960 to 1980 the Government forced 1,75 million people, who settled in urban squatter camps and rural towns after the cancellation of their labour contracts, to the homelands. This contributed to:

semi-urban communities bordering on the homelands;

more people living in single-gender hostels near industries;

an obvious apartheid structure that exists to this day: natural environment features such as rivers, kloofs and ridges, or manmade obstructions such as industrial areas, railway lines separate the different racial groups from each other;

an uneven distribution of urban land, with blacks receiving insufficient land to provide accommodation for all, while such land was also unfavourably located (far from the city centre, close to industrial areas) with an inadequate infrastructure (poor sewerage systems, water and electricity services).

As a result of this state of affairs the black urban population became increasingly dependent on the local environment for their day-to-day needs, invariably causing a rapid deterioration of the environment.

These problems of urbanisation caused the government of the time to start moving away from apartheid.

The pre-election period (from 1990 when Mandela was freed up to the general elections of 1994) was characterised by violence. The ANC and Inkhata Freedom Party (IFP) were involved in a struggle for control of the state.

The pre-election period was complicated even further by economical problems. The downward trend in the economic growth that had already begun in 1980, dropped to negative figures when the economy started to shrink, at a stage when the population was growing at 2,5% per year. The number of people who had to find jobs was increasing, while job opportunities were decreasing. Approximately one out of every three persons was unemployed. The new government implemented the so-called Reconstruction and Development Programme (RDP). This programme was and is still aimed at mobilising the country’s people and its resources to eradicate apartheid and build a democratic, non-racial an non-sexist future.

In 1994 the economy was growing with 2,3%. Many people believed that the new government’s economic policy and discipline would soon address the development priorities of South Africa. However, the legacy of apartheid as mentioned earlier, remains a factor which will determine to what extent the state and society will succeed in meeting the objectives of the RDP.

3. Environmental needs and violent conflict

There are three kinds of environmental needs:

Availability-driven shortages resulting from the impoverishment and depletion of an environmental resource, for example the erosion of land which is suitable for cultivation.

Demand-driven shortages resulting from population growth in a specific area or the growing per capita utilisation of a resource, which then leads to an increased demand for that resource.

Structural shortages resulting when the utilisation of a resource is controlled by a small group of people, while the rest of the population suffer a serious shortage.

The three kinds of shortages often occur at the same time and influence one another. Some of the most common consequences include:

a decrease in agricultural productivity;

economic deterioration;

migration from areas experiencing environmental shortages; and

a deterioration of institutions.

Such shortages and their effects on society can lead to complaints and grievances, which may eventually result in civil violence if two additional factors are present:

Groups with strong collective or unifying identities that might coincide to challenge the state.

Opportunities for violent action against authorities that hold obvious advantages.

This means that grievances may lead to civil rebellion if the dissatisfied parties see themselves as members of groups that can stand together, and if they believe that the best way to address their grievances successfully, includes violence.

Grievances may cause people to stand together because they identify with one another, as they share the same grievances.

Civil violence is an indication of tension between the state and society. If groups in society are of the opinion that the state reacts to their grievances, the level of dissatisfaction with the state remains low.

Environmental shortages upset this delicate balance between state and society. A decrease in agricultural production, urbanisation and economic deteriorisation often lead to hardship. On the other hand it also hampers the state's ability to address the grievances in an appropriate manner because of a decrease in state income. This results in poor communication and interaction between the state and society, and eventually the state loses its legitimacy, while it is no longer representative of society and it stops being sensitive to society.

As long as this situation is allowed to prevail, grievances continue, which may eventually be expressed in deeds of crime.

Assessment

Learning outcomes (LO)
LO 2
GEOGRAPHICAL KNOWLEDGE AND COMPREHENSION The learner can demonstrate geographical and environmental knowledge and comprehension.
Assessment standards(AS)
This is clear when the learner:
2.1 presents a well-argued explanation of some approaches to development [people and places].
LO 3

INVESTIGATING THE PROBLEMS The learner can take informed decisions on social and environmental issues and problems.
This is clear when the learner:
3.1 identifies social and environmental conflicts in South Africa and compares it with other contexts [identifies the problem];
3.3 analyses the reason for differences or conflicts [makes choices].

Social consequences of environmental needs

Social Sciences

GEOGRAPHY

Grade 9

SOCIAL AND ENVIRONMENTAL CONFLICT IN SOUTH AFRICA

Module 10

Social consequences of environmental shortages

Environmental shortages have certain effects on the community. They are called ‘social implications’, of which we name only four.

- A decrease in agricultural production
- A downward trend in the economy
- Migration of the population
- The deteriorisation of institutions (organisations)

Explain in your own words why and how the above-mentioned consequences come about, and cite examples from your own area.

1. Decrease in agricultural production

In the homelands the agricultural potential has decreased due to the increase in population density, water shortages and soil-erosion. In the 1940’s Bophuthatswana farmers produced 110 kg maize per person. Today it has dropped to 50 kg per person.

This resulted in diseases caused by malnutrition, such as kwashiorkor in children and tuberculoses in adults. As the available resources for agriculture and forests decrease, many people are forced to abandon agriculture. They have no choice but to move to towns and cities to accept low-paid jobs.

Marginalised (disadvantaged) rural and urban black people become the victims of growing shortages and inadequate alternative (other) job opportunities. This results in chronic poverty (what is the meaning of “chronic” here?).

2. Downward trends in the economy

A drop in food production has a negative effect on the economy. Agriculture plays a key role in earning foreign income, called valuta. This means that the export of agricultural products ensures a steady flow of money to South Africa from foreign countries. It helps to stimulate the country’s economy.

If, however, production drops as a result of environmental factors, there is not enough food for export. It puts a strain on the economy and leads to entrenchments and unemployment in sectors closely linked to agriculture. Name some of these sectors in your and other areas that suffer when production drops.

3. Migration (movement of the population)

Over the past few years there was an increase in the movement of inhabitants from rural to urban areas. In the 1990’s the tempo at which urbanisation took place, was estimated at 750 000 per year. These people mostly end up in informal settlements. Not all of them manage to find a job in the city.

These migrants experience the same ecological disadvantages in the cities as they had to contend with in rural areas. The concentration of a large number of people in an area with limited resources, leads to the control of resources by certain groups.

Local power structures are formed where certain leaders obtain power by regulating the basic resources such as land and the allocation of houses and services. This can cause tension and malpractices.

Migration also leads to an increase in the number of informal settlements. At present the inhabitants of these settlements represent more than 30% of the total urban population. Informal settlements are found in most South African cities. Near Cape Town, for example, many of these houses consisting of any kind of waste material, from corrugated iron and planks to plastic sheets, are erected along the freeways. What are these inhabitants' biggest problems? What possible solutions can you think of?

a) What basic services are lacking in this informal settlement?

b) Would you say that the inhabitants of these settlements are living under healthy conditions? Give a reason for your answer.

c) What would the consequences be for the inhabitants of these informal settlements if a fire should break out?

4. Deterioration of capacity in institutions such as councils, organisations and services

Due to the large influx of people from rural to urban areas, the provision of services for all inhabitants or their needs invariably suffer. Initially only the supply of basic needs in the neighbourhood is affected, but in the long run the shortage of services gets out of hand. Can you name a few examples?

Consequently some inhabitants become dissatisfied with the influx of people from other areas. Eventually this leads to conflict. Certain groups distance themselves from others, and protect only their own interests. This creates an atmosphere of distrust amongst the population.

People do not migrate only within the borders of the country. Inhabitants from other African countries also stream to South African cities. This gives rise to conflict with the local inhabitants. These people put pressure on our already limited resources. This leads to xenophobia (hate of foreigners), where all people from outside the country's borders are viewed with suspicion. Immigrants, especially from Nigeria, come to South Africa to earn money in the informal sector. Some get involved in illegal activities such as drug dealing. This causes an increase in crime. Do you have any knowledge about immigrants and their activities? What is your opinion? Talk to people who know about these issues, and think of possible solutions.

Activity 1:

To find information on social and environmental conflict in African Countries

[LO 3.1]

In groups

Find information in the library about the role that social and environmental conflict plays in ONE of the following African countries:

1. Zimbabwe
2. Angola
3. Burundi
4. Congo
5. Mozambique

Activity 2:

To develop an awareness and understanding of social and Environmental conflicts in South Africa, more specifically the role of government policy in this regard

[LO 3.1, 3.3]

Discuss and answer the following questions in groups:

a) Describe the difference in landownership between blacks and whites in South Africa.

b) What did the black people in the Bantu homelands do to survive?

c) In the 1960s black people lived mainly in the homelands and in “townships” near the cities. List all the negative experiences they had to endure because of this.

d) Name and discuss FIVE reasons why you think that black people were unhappy with the National Party government.

e) Why did violence escalate after Nelson Mandela was freed?

f) Why did the SA economy stagnate between 1980 and 1990?

g) What was the RDP?

h) Refer to your answers on questions a – g and then give FIVE good reasons for the urbanisation of black people (first write down your own ideas, then share it with the group, and let the group choose the FIVE most important ones).

Assessment

Learning outcomes (LO)
LO 2
GEOGRAPHICAL KNOWLEDGE AND COMPREHENSION The learner can demonstrate geographical and environmental knowledge and comprehension.
Assessment standards(AS)
This is clear when the learner:
2.1 presents a well-argued explanation of some approaches to development [people and places].
LO 3
INVESTIGATING THE PROBLEMS The learner can take informed decisions on social and environmental issues and problems.
This is clear when the learner:
3.1 identifies social and environmental conflicts in South Africa and compares it with other contexts [identifies the problem];
3.3 analyses the reason for differences or conflicts [makes choices].

Memorandum

ACTIVITY1:

Find own answers as a group.

ACTIVITY 2:

a) White people own more land than black people.

Most of the land in white ownership is privately owned while land in black ownership is owned by communities.

Land owned by black people is of inferior quality compared to land owned by white people.

Land owned by black people is situated in unfavourable areas.

b) They were subsistence farmers who produced enough for their own use only.

Created local service industries where they manufactured utility items.

Migratory labourers: Worked in urban areas in mines and factories.

c) Men were removed from their land and families and lived in hostels.

Too many inhabitants – unemployment.

Poor living conditions: social and health problems arose.

d) 1. Policy of apartheid – discuss.

2. Did not receive enough land.

3. Uneven division of land and other resources.

4. Absence of the right to vote.

5. Lack of democracy.

6. Lack of private ownership.

7. Inadequate access to medical and educational services.

e) - An awareness of equality, freedom and human dignity came into being.

- People wanted to shed the yoke of apartheid.

- People wanted land, jobs and basic services.

- People wanted job opportunities and higher wages.

- Education and other services.

- Equal treatment with white people on all levels.

- Power struggle: ANC versus the Inkatha Freedom Party.

f) As a result of the policy of apartheid. The economically developed countries of the world applied sanctions to South Africa. It meant that they had no trade relations with this country and did not invest in the country. Some of the largest brand names in the world withdrew from South Africa in an effort to pressurise the government to terminate the policy of apartheid.

g) The Reconstruction and Development Program. An initiative to present all people with equal opportunities. An initiative of the newly democratically elected government to give previously disadvantaged people access to houses, job opportunities, health care, education, etc.

h) **CONSIDER THE FOLLOWING:**

1. Land ownership

2. Policy of Homelands

3. Job opportunities

4. Housing

5. Lack of basic needs and services

Photography

Social Sciences

GEOGRAPHY

MAP WORK

Grade 9

Module 11

PHOTOGRAPHS

MAP WORK

- Photographs?

1. Why do geographers make use of photographs?

It is quite difficult for someone who has never visited a particular place to form an idea of what such a place might be like. A map is a wonderful aid, but one should keep in mind that maps record different phenomena by means of mapping symbols. This is why photographs can provide a much better image of particular phenomena in places that are far away. The viewer is able to SEE the landscape and the different phenomena that occur in it.

1. So what is a photograph?

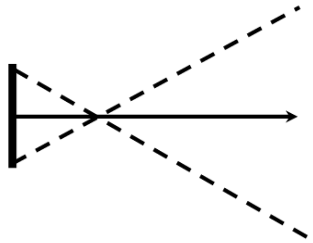
It is a manageable, understandable and realistic miniature image of phenomena that is captured by means of a camera.

2. Different kinds of photographs.

Photographs are classified according to their colour and the angle from which they are taken. Black-and-white photographs are generally used in Geography and the viewer has to rely on his or her experience to know that plants, for instance, are green. Colour photographs are much more true to life, but are expensive.

Different types of photographs are differentiated according to the angle from which they are taken. You got to know some of them in Grade 7.

1. Horizontal photographs:



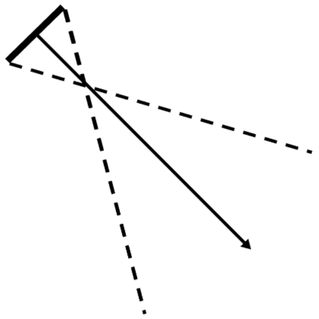
Objects in the foreground of the photograph seem bigger because they are closer to the camera lens. The same kind of object, e.g. a two-storey building, would seem much smaller if it were further from the lens. Behind the closer objects there will be areas that are not visible at all. These areas are known as the hidden ground. (Think of a class photo, for instance: if you stand right behind another learner, you will not be visible in the photograph; you will be part of the "hidden ground".)

1. Oblique aerial photographs:

These photographs are taken from high mountains, buildings or aeroplanes with a camera that is held at an angle to photograph something below. This kind of photograph shows features of the landscape from a reasonably familiar angle and will have much less hidden ground than a horizontal photograph.

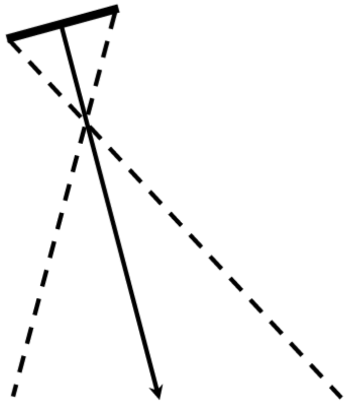
1. High-angled oblique aerial photographs:

If the camera’s axis is tilted away from the vertical axis at a wide angle (60° +), we obtain a high-angled oblique aerial photograph. The horizon will still be visible on the photograph, and there will be almost as much hidden ground as in a horizontal photograph.



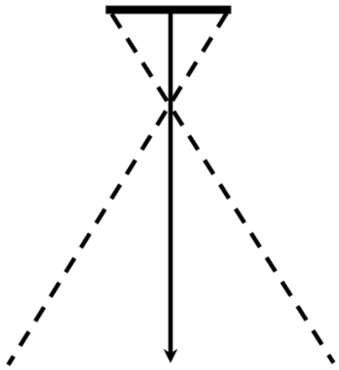
1. Low-angled oblique aerial photographs:

If the camera’s axis is tilted away from the vertical axis at a smaller angle (±30°), we obtain a low-angled oblique aerial photograph. The horizon will not be visible on the photograph at all and the amount of hidden ground will be much less.



1. Vertical aerial photographs:

Vertical aerial photographs are used for drawing maps because the image that they provide is the same as that of a map. They are taken perpendicularly from above with a camera that is mounted on the undercarriage of an aeroplane. The optical axis of the camera therefore forms a 90° angle with the surface of the earth.



1. Vertical aerial photographs have many advantages for geographers:

The scale of the photograph is accurate all over and objects can be drawn accurately.

It shows all features exactly as they appear from above.

There is no hidden ground.

The layout of roads and railways is clear.

High trees and buildings can be recognized by the lengthy shadows that they cast.

Such photographs are used as the basis for assembling the 1 : 50 000 topographic maps and 1 : 10 000 orthophoto maps.

1. How vertical aerial photographs are taken:

The camera is mounted below an aeroplane that flies at a consistent height above sea level. The aeroplane is flown from east to west or from west to east and the photographs are taken in strips. Each subsequent photograph in the strip overlaps the previous photograph by 60%.

As soon as the first strip of photographs has been taken, the aeroplane is turned around and the next strip of photographs is taken from the opposite direction. These two strips have a 30% overlap.

In South Africa, such photographs are taken between 10h00 and 13h00, mainly during summer. Cloudy and hazy days are not suitable for this kind of photography, because important information may be hidden.

Do not take it for granted that the top edge of an aerial photograph shows what is in the north. Maps usually present north at the top, but a photograph is not a map!

Considering that the aeroplane flies from east to west at first and then from west to east, can you explain why the printing on the photograph sometimes is normal and sometimes upside down?

Assessment

Learning Outcomes(LOs)
LO 1
Geographical EnquiryThe learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.
Assessment Standards(ASs)
We know this when the learner:
1.2 asks questions that are relevant for identifying sources;
1.3 draws conclusions and makes analyses to obtain information from

sources such as photographs, maps, atlases, graphs and statistics;
1.4 correlates information from different sources;
1.7 reports on knowledge that they have obtained through research, making use of different sources of information.
LO 2
Geographical Knowledge and UnderstandingThe learner will be able to demonstrate geographical and environmental knowledge and understanding.
We know this when the learner:
2.2 identifies ways in which Science and Technology have contributed a positively and negatively influence to development (people and resources.)

Recognising topographic features

Social Sciences

GEOGRAPHY

MAP WORK

Grade 9

Module 12

Recognizing topographic features on vertical aerial photographs and orthophoto maps

It requires a great deal of practice to be able to recognize features on vertical photographs. You have had some experience of this in Grade 8. If you are unable to recognize something at first glance, you need to ask particular questions to obtain background information from a topographic map:

In which part of the country is the area?

What type of climate and vegetation occur in this area?

What farming activity is practiced in the area? – etc.

Answers to such questions can be obtained from various sources, such as an atlas, for instance.

The most important indicators on photographic images are the following:

Form

Geometric forms indicate objects made by people. Railway lines are shown as fine lines with gradual curves and junctions; roads are broader and have right angle junctions. Cultural features are even and follow a definite pattern. Natural features, like rivers, which have meandering confluences, are irregular.

Size

Different buildings may have the same shape, but size will indicate the difference between a hut, a house and a factory. Road widths usually are quite clearly identifiable.

Shadows

High, relatively thin features like church spires, telephone poles, lighthouses and factory chimneys may be too small to observe from above. Their shadows will give an indication of their location and shape.

Long shadows, however, hide certain other features. For this reason, photographs should not be taken too early or too late in the day. The best time for taking aerial photographs is between 10 o’clock in the morning and 2 o’clock in the afternoon.

Shadows also indicate direction and this helps the reader with the orientation of the map. In the Southern Hemisphere, shadows usually lie **southward**.

ACTIVITY 1: [LO 1.4]

The sun rises in the east and sets in the west. Vertical aerial photographs should be taken between two hours before and two hours after 12 o’clock. In which direction will the shadows fall during this time?

In the morning:

In the afternoon:

Social Sciences

GEOGRAPHY

MAP WORK

Grade 9

Module 11

Shading

The shading of a photograph depends on the height of the sun and the amount of light that is reflected by the photographed object. The following examples are useful guidelines for testing information involving shading:

Dark	Dark	Explanation
Uneven surfaces.	Uneven surfaces.	Smooth surfaces reflect light, while uneven surfaces absorb light.
Clear water.	Murky water.	Light penetrates clear water, but is reflected by clouded or murky water.
Stagnant water.	Rippling waters.	Waves/ripples cause dispersed reflection of light..
Wet soil.	Dry soil.	Wet soil absorbs more light.
Plant cover.	Bare ground.	Vegetation absorbs light (sand appears white.)
Ploughed	Fallow	Ploughing breaks up the reflective

lands.	lands.	surface into smaller areas.
Established crops.	Newly-sown crops.	Larger crops absorb more light.
Rivers.	Roads.	Tarred roads seem white because they reflect light (in spite of seeming dark when we look at them).

Texture

Texture indicates land use and ground cover patterns. Citrus orchards, for instance, show a rougher texture than fields of maize. Sand looks smooth and shrubby ground seems woolly.

Some examples of land use are:

Land use	Features
Cultivated fields	crops have a variegated appearanceharvested wheat fields or fields of feed crops are light and smoothFields on which threshing machines are used show clearly visible lines of dotsploughed fields appear striped and are darker
Orchards and vineyards	they usually have a chequered appearanceorchards are roughly texturedvineyards show a finer texture and sometimes appear striped
Forests and	seem dotted or variegatedhave a recognisable linear pattern

plantations	
Pasturage	seems to have small spots or is dottedanimal paths appear as fine white lines that converge at a drinking place

Easily identifiable features:

Schools usually have sports fields.

A golf course has fairways and greens.

Urban settlements reveal residential differentiation:

buildings situated in close proximity indicate the city centre or low-income housing;

buildings on large plots indicate high-income housing.

Airports have easily recognisable runways.

Mining areas are revealed by conspicuous mine dumps and excavations.

Telephone lines and power lines are recognized by the regularity of their shadows.

Assessment

Learning Outcomes(LOs)
LO 1

Geographical EnquiryThe learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.
Assessment Standards(ASs)
We know this when the learner:
1.2 asks questions that are relevant for identifying sources;
1.3 draws conclusions and makes analyses to obtain information from sources such as photographs, maps, atlases, graphs and statistics;
1.4 correlates information from different sources;
1.7 reports on knowledge that they have obtained through research, making use of different sources of information.
LO 2
Geographical Knowledge and UnderstandingThe learner will be able to demonstrate geographical and environmental knowledge and understanding.
We know this when the learner:
2.2 identifies ways in which Science and Technology have contributed a positively and negatively influence to development (people and resources.)

Memorandum

ACTIVITY1:

Mornings - slightly south-west

Afternoons - slightly south-east

Magnetic North map skills

Social Sciences

GEOGRAPHY

MAP WORK

Grade 9

Module 13

Magnetic North Map skills

You became acquainted with basic map skills in Grade 8 and did exercises that involved the 1:50 000 topographic map of Alice. In doing that, you learned to:

determine location

gauge accurately and determine direction

calculate distance by making use of a scale

explain the naming of a map

recognise conventional map symbols

recognise representation of height on maps

identify contour patterns

This knowledge, together with what you will still be acquiring in using the 1:50 000 topographic map of Bloemfontein and a 1:10 000 orthophoto map of a portion of this will see you through this year’s work.

Before commencing the practical exercises, you have to learn a number of additional map skills.

Calculating distance on an orthophoto map.

Orthophoto maps are always drawn to the scale of 1:10 000. Follow the steps to determine distance:

Accurately measure the distance between two points in centimetres, using a ruler (or using a string if the line to be measured curves);

Convert this distance to kilometres or metres, depending on what is required.

Example

A_________________________________B

The length between A and B is 10 cm.

Scale 1 1:10 000

What is the true distance in km?

10 cm x 10 000

100 000 cm ÷ **100 000**

1 km

What is the true distance in m?

10 cm x 10 000

100 000 ÷ 100

1000 m

Why do we divide by 100 000 and 100?

The metrical units of measurement can be represented as follows:

Km	Hm	Dm	M	dm	cm	mm
1	0	0	0	0	0	
			1	0	0	

We therefore have 100 000 cm in 1 km

and

100 cm in 1 meter

You may therefore follow the shorter method if you can remember that the scale of

1 : 10 000 is the same as:

1 cm = 10 000 cm

1 cm = 100 m (÷ 100)

1 cm = 0,1 km (÷ 100 000)

ACTIVITY 1: [LO 1.3]

1. Calculate the true distance in metres if the distance on a 1:10 000 orthophoto map is as follows;

   a. 5,8 cm.

b. 10,1 cm.
c. Calculate the true distance in kilometres if the distance on a 1:10 000 orthophoto map is as follows;

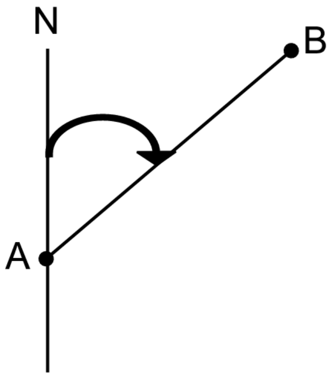
a. 92,2 cm.
b. 15,6 cm. Magnetic North and Magnetic Declination

You have learnt how to gauge accurately in Grade 8. Remember the steps that have to be followed:

Connect the two points by means of a pencilled line.

- Draw a line to show True North through the point FROM which you have to measure.
- Position the protractor by placing 0° against the line indicating north and the centre at the point from which the measurement is to be taken.
- Measure the angle clockwise from the line for north to the connecting line (pencilled line of Step 1.)

Example:



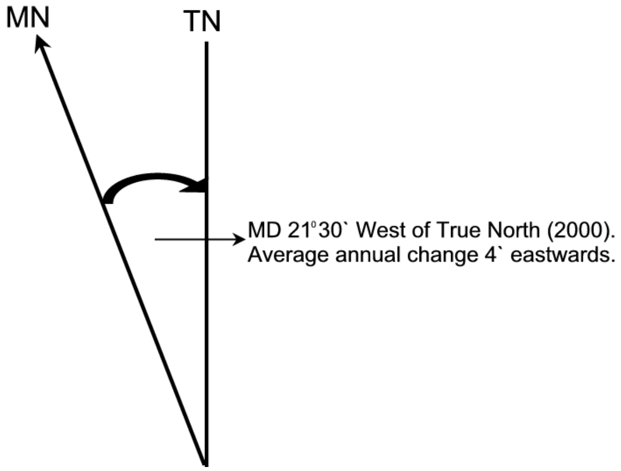
On a map, North therefore indicates the North Pole, which we refer to as TRUE NORTH (geographic north.)

The earth also has a magnetic field that extends from north to south, for which we use a compass. The earth’s magnetic field does not correspond exactly with the true North and South Poles. North as indicated by the compass will always lie WEST of TRUE NORTH (TN) and is known as MAGNETIC NORTH (MN).

The difference between true north and magnetic north is known as the MAGNETIC DECLINATION (MD). The Magnetic Declination differs from place to place and continuously increases and decreases at any place, because magnetic north is not a fixed point.

To make it possible to determine the Magnetic Declination of any place, the following information is given in the margin of a 1:50 000 topographic map:

Example:


MN
TN
MD 21°30` West of True North (2000).
Average annual change 4` eastwards.

Calculate magnetic declination as at present:

Step 1:

Calculate the difference in years = 2003 – 2000

= 3 years

Step 2:

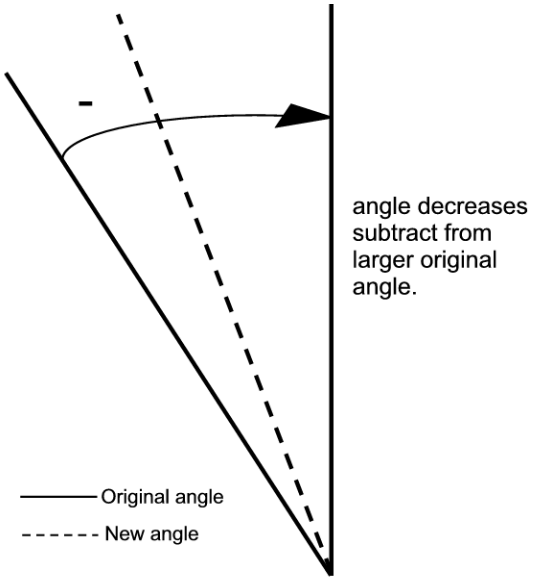
Multiply the years by the annual difference in minutes = 3 years x 4'

= 12'

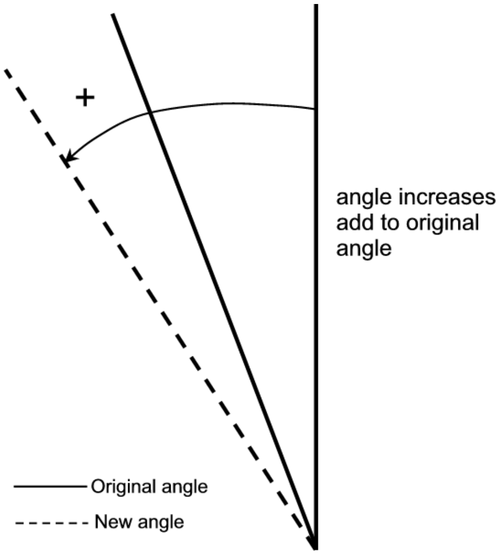
Step 3:

Determine whether the angle increases (eastwards) or decreases (westwards).

Eastwards (smaller) -



Westwards (bigger) +



Step 4:

Add the minutes (westwards) or subtract them (eastwards).

In this instance it is eastwards, therefore:

21°30' - 12'

= 21°18' West of True North

REMEMBER that there are 60' in 1°.

If you should have to subtract and find that the degrees to be subtracted are too many, you “borrow” 1° and convert it to minutes.

Example:

21°30' – 34'

20°90' - 34'

= 20°56' West of True North.

If you should have to add minutes and get an answer that is more than 60’, you have to convert it 1°.

Example:

21°30' + 34'

21°64'

= 22°04' West of True North.

Step 5:

Remember to write West of True North alongside the new declination, because Magnetic North ALWAYS lies WEST of True NORTH.

Magnetic North

To gauge Magnetic North between two points, the degrees of TRUE NORTH must be added (+) to the Magnetic Declination and the answer must be written in degrees:

Example:

TN + MD = MN

50° + 21°18' = 71°18'

Assessment

Learning Outcomes(LOs)
LO 1
Geographical EnquiryThe learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards(ASs)
We know this when the learner:
1.2 asks questions that are relevant for identifying sources;
1.3 draws conclusions and makes analyses to obtain information from sources such as photographs, maps, atlases, graphs and statistics;
1.4 correlates information from different sources;
1.7 reports on knowledge that they have obtained through research, making use of different sources of information.
LO 2
Geographical Knowledge and UnderstandingThe learner will be able to demonstrate geographical and environmental knowledge and understanding.
We know this when the learner:
2.2 identifies ways in which Science and Technology have contributed a positively and negatively influence to development (people and resources.)

Memorandum

ACTIVITY1:

- 580 m
- 1 010 m

- 9,22 km
- 1,56 km

ACTIVITY2:

1. True North / Bearing :

Magnetic Declination:

1990 – 2003 = 13 years

13 × 2’ = 26’ westwards

$18^0$41’ + 26’ (westwards)

= $18^0$67’

= $19^0$07 west of true north

Magnetic Bearing: WN + MD = MN

…… + $19^0$07 = ………………………..

1. Actual Bearing :

Magnetic Declination: 1993 – 2003 = 10 years

10 × 3’ = 30’ eastwards (-)

$20^0$15’ – 30’

$19^0$75 – 30

= $19^0$45’ west of true north

Magnetic Bearing: WN + MO = MN

.... + $19^0$45 =..................................

Calculating area oo a map

Social Sciences

GEOGRAPHY

MAP WORK

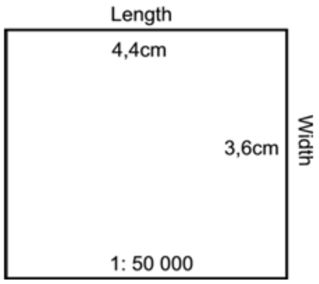
Grade 9

Module 14

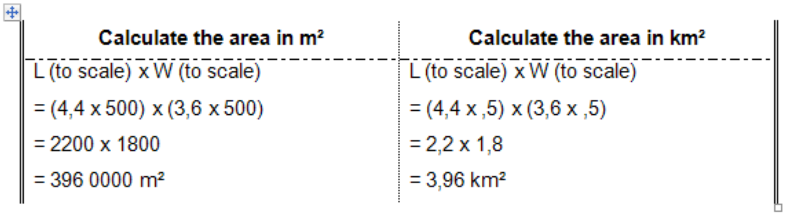
CALCULATING AREA ON A MAP

Calculating area on a map.

Example



Formula : L (to scale) x W (to scale)



Calculate the area in m²	Calculate the area in km²
L (to scale) x W (to scale)	L (to scale) x W (to scale)
= (4,4 x 500) x (3,6 x 500)	= (4,4 x ,5) x (3,6 x ,5)
= 2200 x 1800	= 2,2 x 1,8
= 396 0000 m²	= 3,96 km²

Steps:

1. Measure length in cm and convert to m / km.
2. Measure width in cm and convert to m / km.
3. Apply formula – L x W.
4. Write the answer in km² / m².

Always take note of the unit in which the answer must be given – this will usually be m² or km².

ACTIVITY 1: [LO 1.3]

1. The length of a rectangular object is 5,6 cm and the width is 3,4 cm on a 1 : 50 000 topographic map. Calculate the area of the object in km².
2. The length of a building is 1,1 cm and the width is 0,6 cm on a 1 : 50 000 topographic map. Calculate the area of the building in m².Calculating time between 2 points.

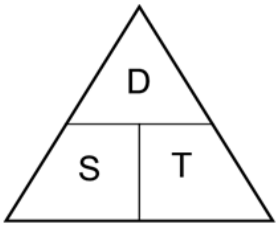
Remember the following:

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} \quad \text{or}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \quad \text{or}$$

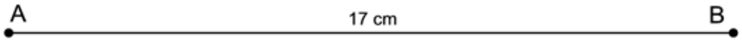
THEREFORE

$$\text{Distance} = \text{Speed x time}$$



The distance completed will have to be calculated from the map and be given in real km. Speed or time will always be provided.

EXAMPLE:



1 : 50 000

How long will it take to travel by car at 60 km/h from point A to point B?

Steps:

1. Convert the distance in cm to real distance in km.

   17 cm x ,5 = 8,5 km

2. Apply the formula: Time $= \frac{\text{Distance}}{\text{Speed}}$

   $= \frac{8{,}5 \text{ km}}{60 \text{ km/h}}$

   = 0,142 of an hour

3. Convert to minutes: = 0, 142 x 60

   = 8,52 minutes

ACTIVITY 2: [LO 1.3]

At what time will a person arrive at a destination if he or she leaves the house at 7:00 and travels a distance shown as 8 cm on a 1 : 50 000 map? Reading and analysing maps

Topographic maps are among the most useful and precise maps that are available because of the amount of detail that they contain and the precision with which the minutest details are indicated.

Topographic maps and orthophoto maps provide the geographer’s tools (SOURCE) and the reader needs to understand the language of the map. This makes it possible to give scientific explanations of features.

The activities that follow will help the learner to master map-reading techniques and skills and to extend his or her knowledge of Bloemfontein.

ACTIVITY 3: [LO 1.7]

Consult your atlas to answer the following questions:

- Find out where Bloemfontein is situated by using the index at the back of the atlas.
- In which province of South Africa is Bloemfontein?
- Indicate the direction to Durban from Bloemfontein.
- Measure the distance between Edenburg (south of Bloemfontein) and Bloemfontein in km, using the linear scale given for the map in your atlas.
- At what time will a bus arrive in Bloemfontein if it leaves Edenburg at 10:00 and travels at an average speed of 120 km/h, without stopping along the way?
- Read the accompanying text and answer the questions dealing with Bloemfontein’s past.

Provide reasons for the city’s:

- 1. origin;
  2. development as a city.

- The development of Bloemfontein
- More that a hundred years ago, trekkers from the Cape settled in the environment of Bloemfontein, which quickly developed into a centre for trading. In 1846, the location of the present city was selected by Major Warden as the most convenient site for building a fort and a residential area. From this beginning, and in spite of setbacks resulting from unrest and wars, which inhibited its development, the small town developed into an attractive city.
- Bloemfontein forms the geographical hub of South Africa’s railway, road and airline services. The development of the Free State gold mines, less than 160 km from the city, has brought additional prosperity to the city, which is fast becoming an important industrial centre.
- The city is situated in a picturesque environment in the heart of the Free State plateau, surrounded by hillocks and hills rising high above the plains. To the north is Naval Hill, from where there is a particularly beautiful view of the city.

ACTIVITY 4: [LO 1.3]

Study the accompanying extract from the 1 : 50 000 topographic map of South Africa, sheet 2926 AA Bloemfontein, and orthophoto 2926 AA 9 Spitskop and answer the following questions:

1. Identify the features of the landscape that occur at the following coordinates:

a) 29º05'40" S, 26º09'20" E.

b) 29º06' S, 26º10'35" E.

2. Indicate the position of the 2926 AA Bloemfontein map sheet by means of a simple sketch:

Indicate which map sheet lies directly to the:

a) North

b) West

c) South ______ of 2926 AA.

1. Indicate the position of the 2926 AA 9 Spitskop orthophoto by means of a simple sketch:

1. How does the scale of a topographic map and of an orthophoto differ?

Which scale is larger?

- What can you identify with regard to recreation facilities available to the inhabitants of Bloemfontein by careful investigation of the topographic map and the orthophoto?
- Why do we observe a considerable number of wind pumps in the environment?
- Study the precipitation figures for Bloemfontein that are provided below:

	J	F	M	A	M	J	J	A	S	O	N
Rainfall in mm	91,4	78,7	76,2	55,9	25,4	7,6	10,2	11,2	15,5	50,8	66

a. Draw a column graph to represent the rainfall data. Use a vertical scale of 1 cm to 10 mm.

1. Which season has the highest rainfall?

1. Which month receives the highest rainfall?

ACTIVITY 5: [LO 1.4]

1. A cellular telephone service provider wants to erect a communications tower for the cellular phone service. It has to be situated on the highest point in the area. Provide the height in metres of the highest point indicated on the map. Also provide the coordinates for the specific point.

2. Provide a reason why the observatory (Observatory Theatre) was built on Naval Hill (29°05’45” S, 26°14’20” E) and not in a more central part of the city.

3. Calculate magnetic north from trigonometry beacon Δ 50 (29°03’45” S, 26°10’50” E). Show all calculations.

4. How long will it take a traveller to go from the one N1 intersection (29°07’45” S, 26°10’ E) to the other N1 intersection (29°05’30” S, 26°10’20” E) if an average speed of 120 km/h is maintained?

5. Calculate the area of the terminal building of the railway line (square black building) at 29°06’50” S, 26°14’50” E. Show all calculations.

6. What is true north from Δ 174 (29°05’25” S, 26°11’30” E) to the peak of Spitskop (29°05’40” S, 26°9’20” E.)

ACTIVITY 6: [LO 1.2]

Use the orthophoto only and answer the following questions:

1. Is this orthophoto a vertical or an oblique aerial photograph?
2. Which part of Bloemfontein is shown on the orthophoto? Indicate the exact position with faint pencil lines on the 1 : 50 000 or topograpic map sheet.
3. What is the real distance in km from the N1 road junction near Tempe (at Dam van Trane) to the road junction near Rayton in the northeast?
4. In which direction do you travel from the Tempe road junction to the road junction near Rayton?

5. Which kind of activity will take place at Tempe? Look at the long buildings arranged in rows that are there, in particular. What is the direction in which the shadows of these buildings fall?

1. At what time of day, therefore, was the photograph taken?

ACTIVITY 7: [LO 2.2]

Make a poster about Bloemfontein. It must be eye-catching to attract visitors and tourists.

Your poster should present the following information:

1. Tourist attractions.

1. The recreational facilities of the city.

1. Extra-mural activities offered by the city.

Assessment

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Memorandum

ACTIVITY1:

1. L × B

(5,6 × 0,5) × (3,4 × 0,5)

2,8 × 1,7

= 4,76 km^2

- L × B

(1,1 × 500) × (0,6 × 500)

550 × 300

165 000 m^2

ACTIVITY 2:

*DistanceSpeed*1. Actual distance = 8 × 0,5 = 4 km

Time =

$= \frac{4\text{km}}{80\text{km}/h}$

= 0,05 × 60

= 3 minutes

- 7:00 + 3 minutes

= 7:03

ACTIVITY 3:

1. 29^{0}08’ S, 26^{0}15’E
2. Free State
3. ESE
4. ± 70 km
5. Time = $\frac{\text{Distance}}{\text{Speed}}$

$= \frac{70\text{km}}{120\text{km}/h}$

= 0,583 × 60

= 34,98 minutes

- 10:00 + 34,88 = 10:34,98
- Origin of Bloemfontein

a. People who migrated from the Cape settled there.
b. In 1846 Major Warden chose it as a suitable place to build a fort and settlement.

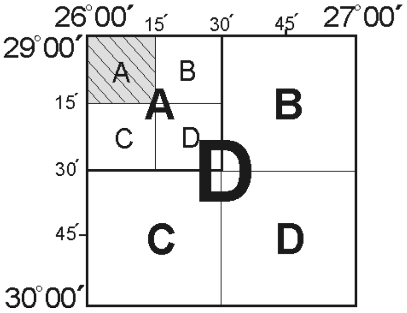
Development of Bloemfontein

- Initially it quickly developed into a trading centre.
- Wars and insurrection did not halt the growth.
- Geographic centre of rail, road and air transport.
- Gold-fields 160 km away boost growth.
- Today an important industrial centre.
- Tourism is flourishing thanks to picturesque surroundings.

ACTIVITY 4:

1a) Pointed hill

b) Flat-topped hill (Naval Hill)

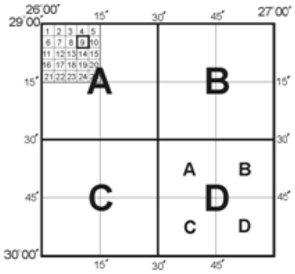


3a) 2826 CC

b) 2925 BB

c) 2926 AC

4.



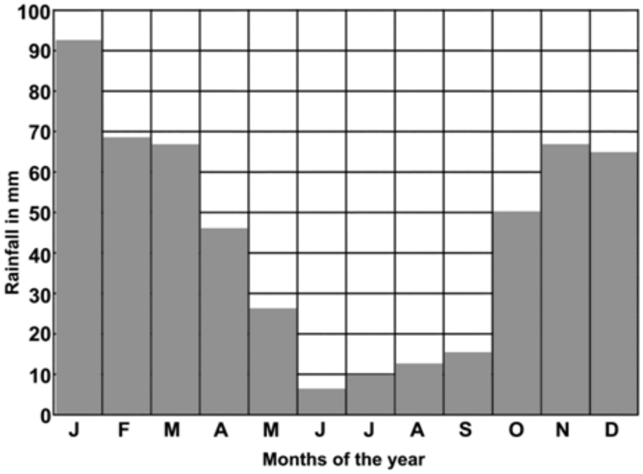
5a) Topographical map = 1:50 000

Orthophoto = 1:10 000

b) Topographical 1:50 000 is a smaller scale

- Motor or motorcycle racing, camping in caravan park, golfing, hang-gliding, flying aeroplanes, visiting zoo, visiting parks, visiting botanical gardens, playing sports on sports fields, swimming in rivers and dams, sailing on dams, visiting observatory, etc.
- Windmills are used to retrieve underground water for consumption. Therefore it must be relatively dry here with intermittent rainfall.

8 (a)



a. Winter
b. January

ACTIVITY 5:

1. Highest point 1499

Co-ordinates: 29^0 05’ 50” S 26^0 13’ 20’ E

1. Higher, flat area from where there is a good view.

City lights and pollution have smaller effect here.

3. True North / Bearing : 164^0

Magnetic Declination : 2001 – 2003 = 2 years

2 × 6’ westwards (+)

$20^0$35’ + 12’

= $20^0$35’ west of true north

Magnetic Bearing = 640 + $20^0$35’

= $184^0$35’

4. Map distance = 8,5 cm × 0,5 = 4,25 km

Time = $\frac{\text{Distance}}{\text{Speed}}$

= $\frac{4{,}25\text{km}}{120\text{km}/h}$

= 0,35 × 60

= 2,1 minutes

1. L × B

(0,9 × 500) × (0,5 × 500)

450 × 250

= 112 500m^2

6. Actual bearing = 266^0

ACTIVITY 6:

1. Vertical
2. Learners do on map
3. Actual distance = 26,6 cm on a 1:10 000 map

26,6 × 0,1

= 2,66 km

1. North-east
2. Defence Force training centre

Many soldiers who live in barracks

6.a) South-east

b) Afternoons

ACTIVITY 7:

In order for a poster to catch the eye, it must be easy to read.

Make use of photos, sketches, etc. and limit the text to a minimum by listing only the most important facts.